The Mining Journal

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Vol. CCXLVI No. 6292 — LONDON, MARCH 23, 1956 — PRICE 9d.

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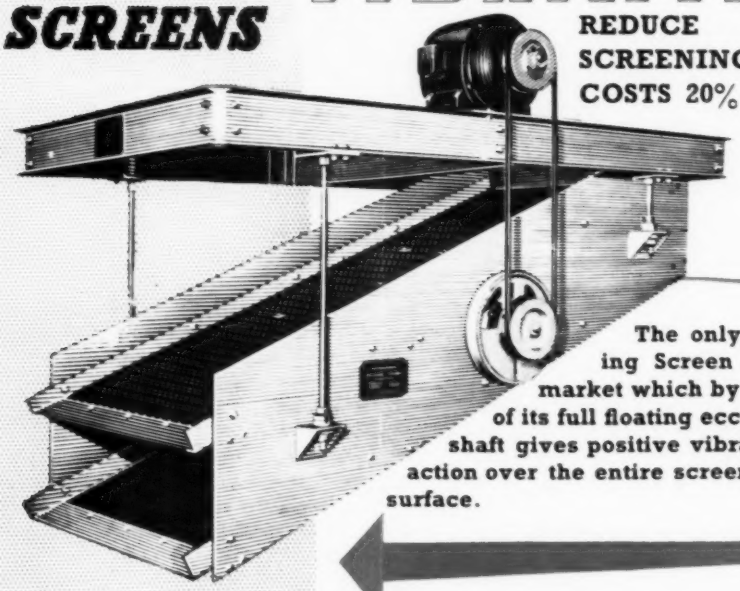

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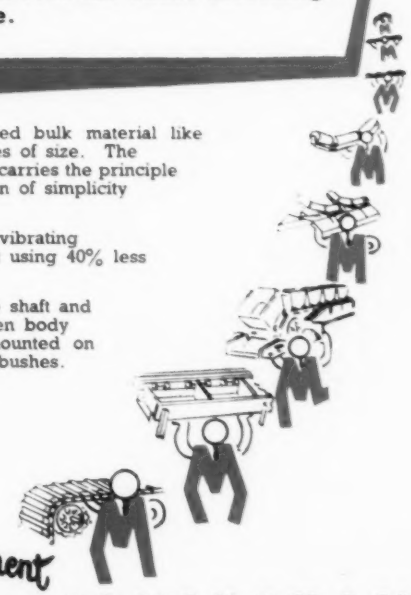

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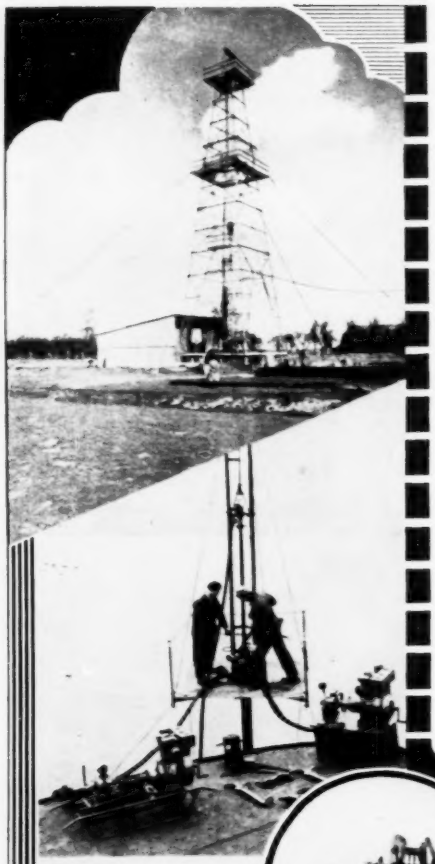

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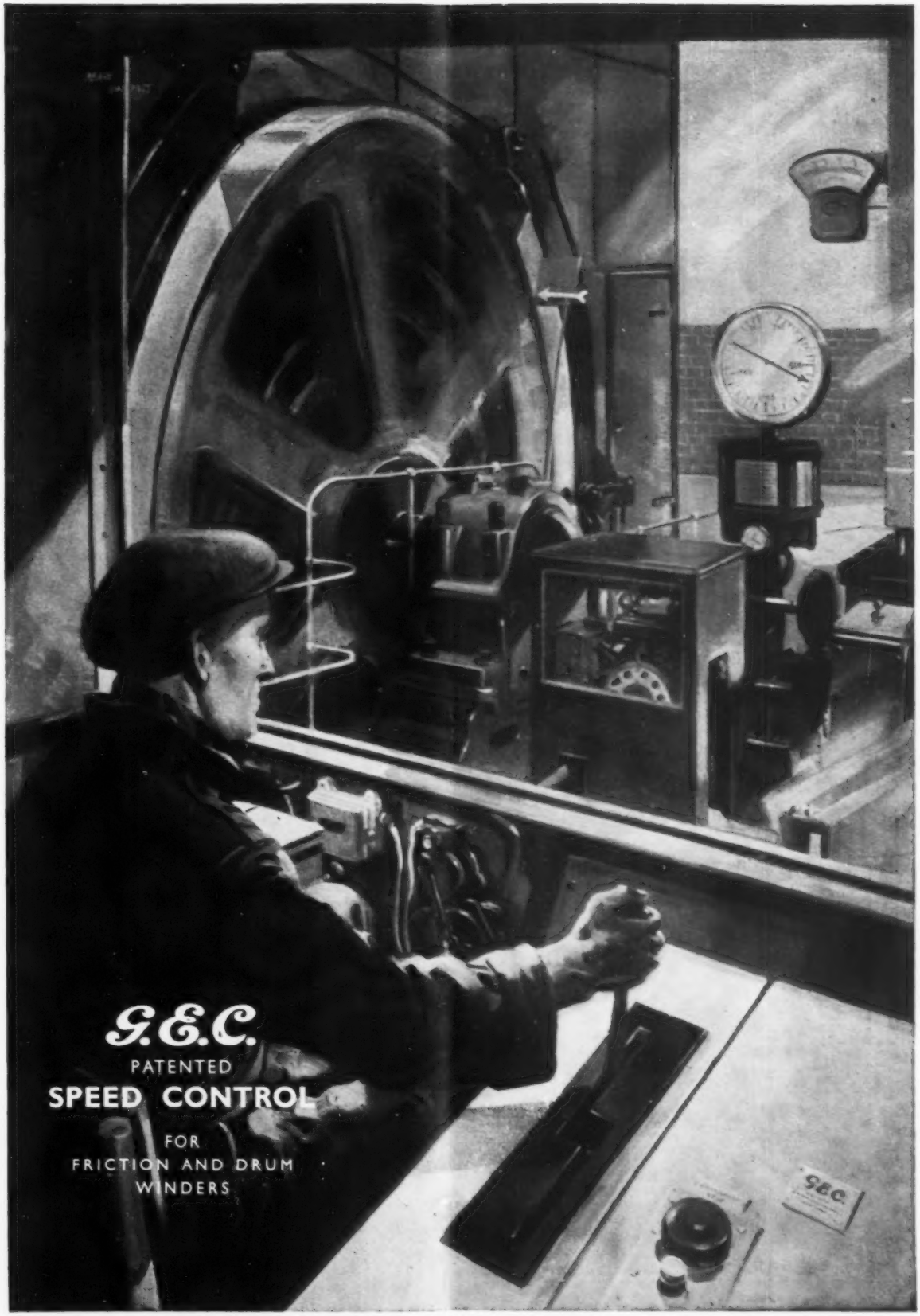


THE GENERAL ELECTRIC CO. LTD., MAGNET HOUSE, KINGSWAY, LONDON, W.C.2

DRILLING SOME OF THE HARDEST ROCK IN THE WORLD

Atlas Copco drills and Sandvik Coromant steels brought in to do the job at the Orkla pyrite mine, Norway

The Orkla pyrite mine is by far the largest of its kind in Norway and has been in operation for 300 years. About 350,000 tons of the ore are mined annually, most of it going to a Norwegian metallurgical plant producing elementary sulphur and copper matte.

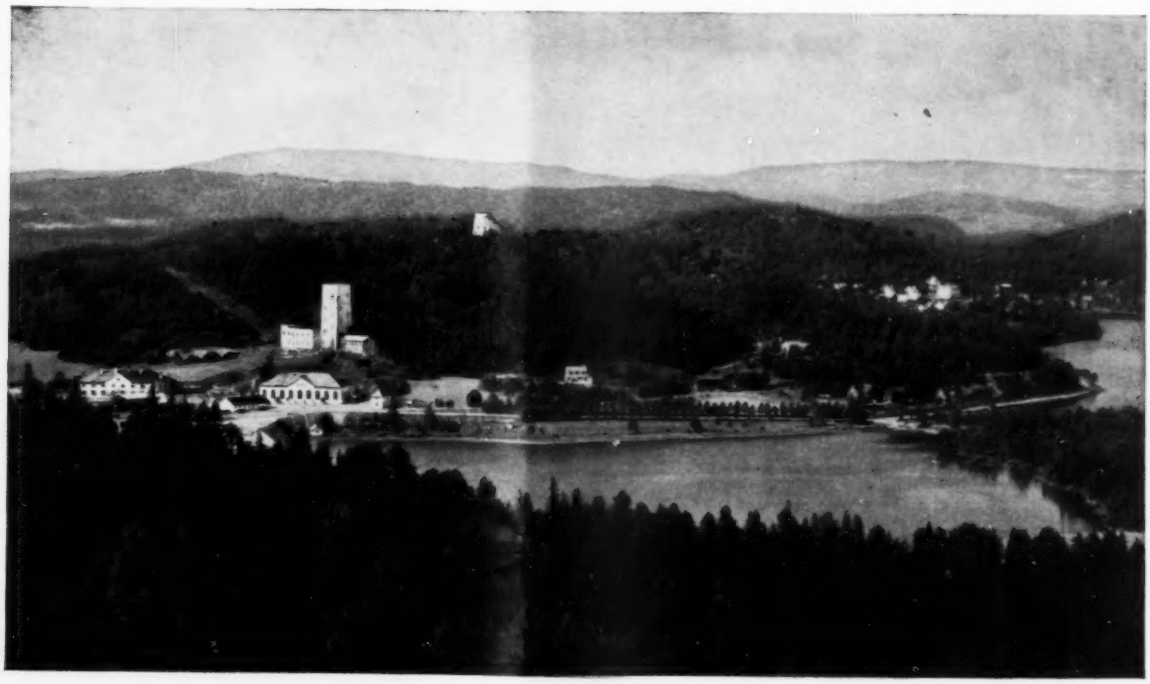
The Orkla pyrites are a fine-grained tight structure containing finely-distributed quartz. The ore is exceptionally hard : *said to be the most difficult in the world to drill.* Over the years, 90 different types of rock drills and numerous grades of drill steels have been tested in the mine. The most recent and most successful have been special Atlas Copco rock drills fitted with Sandvik Coromant tungsten-carbide-tipped steels of an extra-hard quality. *This drilling unit has now been adopted throughout the Orkla mine.*

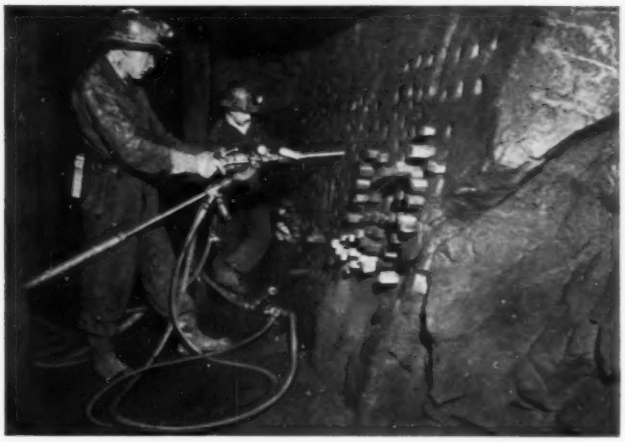
Slow going before arrival of new drilling equipment

The drilling technique at the Orkla mine previous to the introduction of Atlas Copco drills and Sandvik Coromant steels, was based on the use of one-inch hexagonal hollow carbon steels with 6-point star bits and 134-pound stopers mounted on columns. Progress was anything but smooth. Seizures were often experienced and drill steel wear was considerable. Over one ton of steels were used per machine to drill a five-foot round, requiring about 400 steels altogether. Again, one steel was redressed per ton of raw ore produced, and up to 24 drillsmiths and 12 haulers were engaged on this work.

Special drill and steels developed

There is no doubt about it at all. The combination of Atlas Copco drills and Sandvik Coromant steels has completely modernised and speeded production at the





Above: Stoping at the Orkla mine with an Atlas Copco rock drill and a Sandvik Coromant tungsten-carbide-tipped steel. This equipment has now been adopted throughout the mine.

Left: The special Atlas Copco drill specially developed for the mine, being tested in the Orkla pyrite, said to be the hardest rock in the world.

Orkla mine. First tests with ordinary tungsten-carbide steels gave advances of ten inches after each regrind and a total footage of fifty inches per steel. The steels were then modified to suit local conditions. In addition, Atlas Copco also got to work developing a new type of rock drill, the BBE 12DK, specifically for the Orkla pyrites. This machine weighs only 54 pounds, is mounted on a pneumatic pusher and has a striking power of 4,800 one-inch blows per minute.

Now! Steels that go 50 ft. in the Orkla pyrite

The special Atlas Copco drills and Sandvik Coromant steels were finally introduced throughout the Orkla mine in 1953 *after footages of as much as fifty feet had been obtained per steel.* Today, the steels go 2.6 feet before a regrind and equipment in the redressing shop has been reduced to 4 grinders and 3 haulers. Standard Atlas Copco drills fitted with Sandvik Coromant steels have also been adopted for drilling jasper, which occurs in the Orkla mine. Here too, Atlas Copco equipment and drilling methods have made another great success with footages up to 1,000 feet per steel.

Atlas Copco is the world's largest group of companies specialising in the development and manufacture of compressed air equipment. It embraces thirty-one Atlas Copco companies and twenty-four agents, manufacturing or selling and servicing Atlas Copco equipment in more than fifty countries.

For further technical information about Atlas Copco Rock Drills and Sandvik Coromant Steels, write to the most convenient of the addresses given here :

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CANADA, Atlas Copco Canada Ltd., Montreal, A.M.F., P.Q.; AUSTRALIA, Atlas Copco Australia Pty. Ltd., P.O. Box 54, Auburn, N.S.W.; SOUTH AFRICA, Delfos & Atlas Copco (Pty.) Ltd., P.O. Box 504, Benoni, Transvaal; U.S.A., Atlas Copco Pacific, Inc., 930 Brittan Avenue, San Carlos, California; Atlas Copco Eastern, Inc., P.O. Box 2568, Paterson 25, N.J.

If you have any difficulty in finding the name of your local Atlas Copco company or agent, please write to Atlas Copco AB, Stockholm 1, Sweden.

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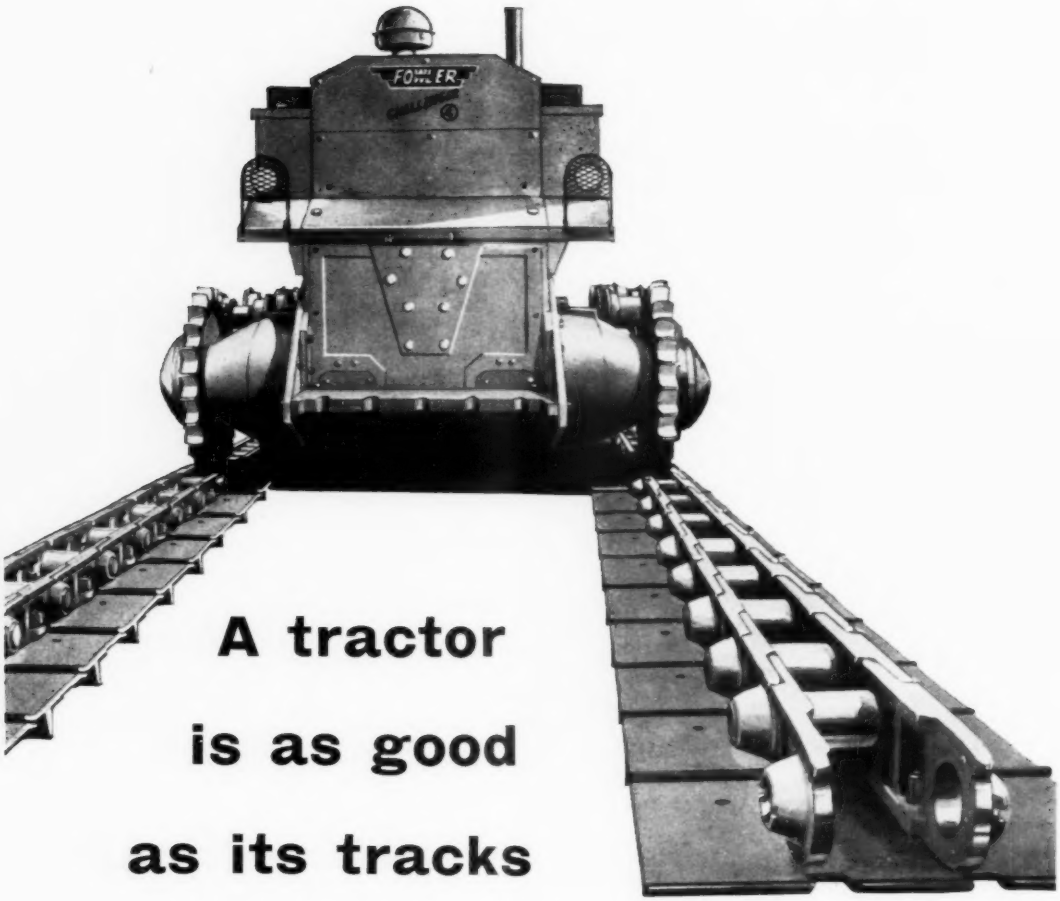

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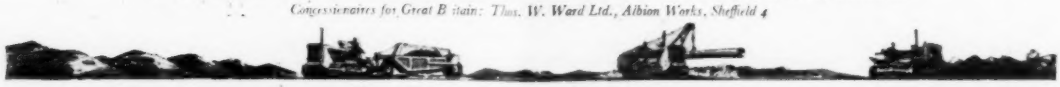

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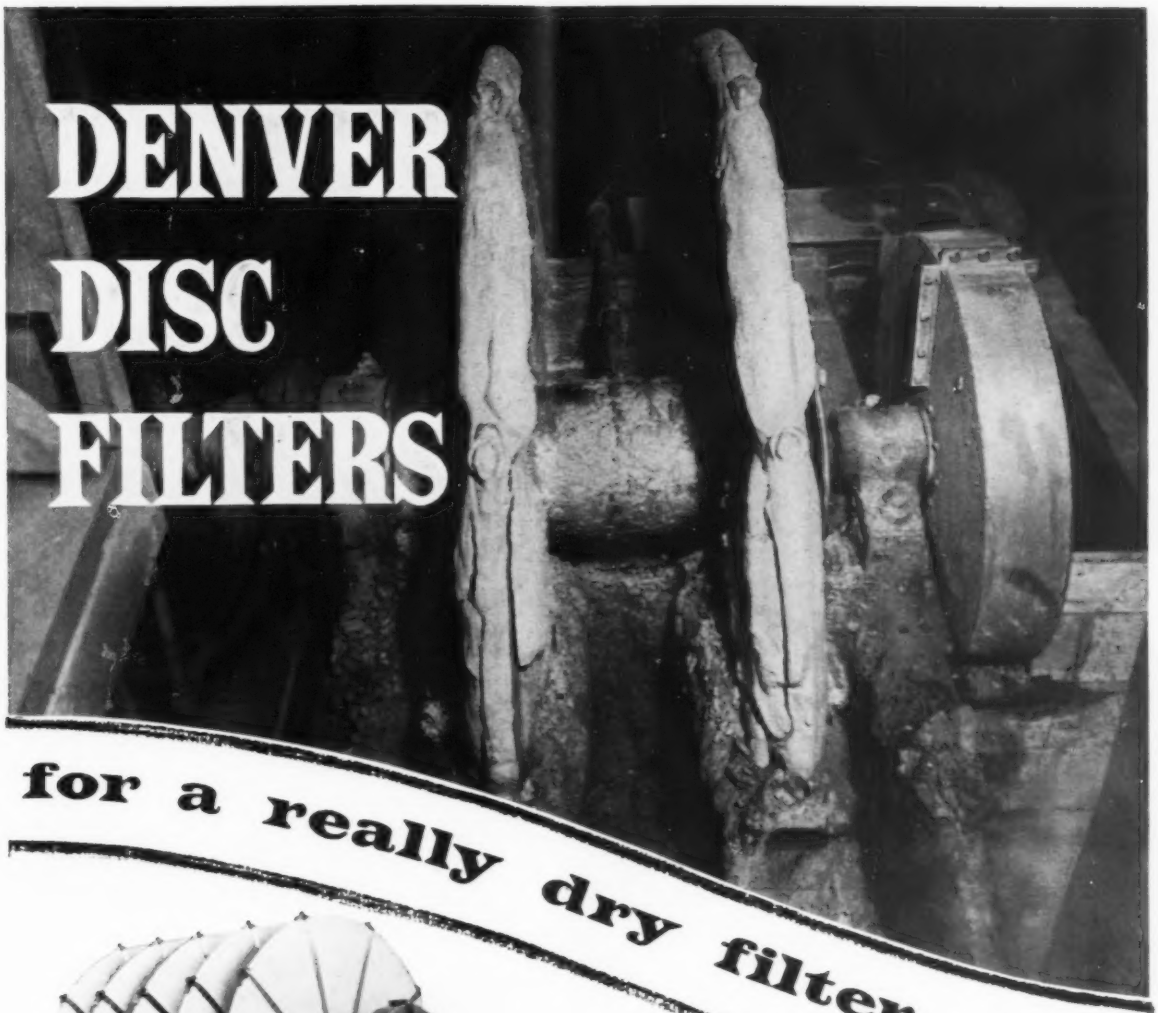

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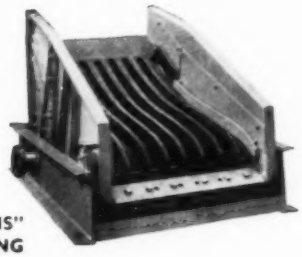

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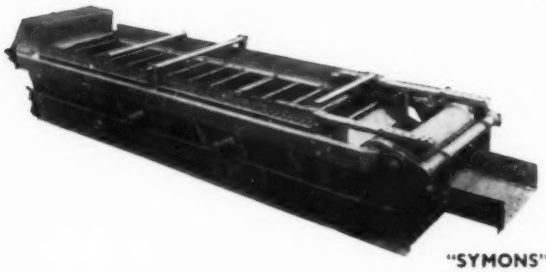

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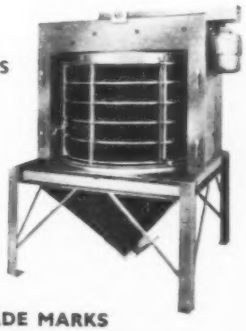

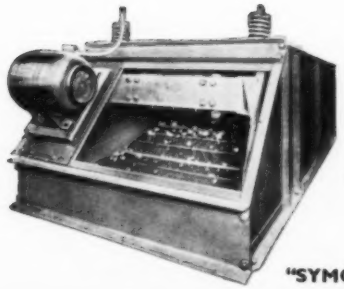

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NOTES AND COMMENTS

Chile Calls the Tune

Kennecott has not yet announced its adherence to Anaconda's new policy of pricing its Chilean copper production on the basis of London Metal Exchange quotations, but this is felt to be only a matter of time. What is the significance of the change?

In spite of some rather rash speculation, there is very little information in the published statements. For instance, it is not revealed where the proposal originated that Chilean copper should be sold in America at the L.M.E. instead of the E. & M.J. price. Did the Chileans ask for it; or did the Americans offer it? Equally one cannot be certain that the change had not been discussed when previous changes in the American price were made, as the initiative in every price increase since the beginning of 1955 has come from the Chileans who have all along been dissatisfied with the receipts from America.

Clearly the changeover, however spectacular, is not evidence of any change by either the Chileans or the Americans in their views on how copper ought to be marketed. The Chileans want a high price, but that is not evidence that they want a free market. The Americans have accepted the L.M.E. quotation in the United States for Chilean metal, but not for their domestic output. Indeed, it seems to be the case that the changeover is a device for allowing the Chileans a higher income for their copper while leaving the Americans free to pursue their own policy of selling their own production at fixed prices. In many recent speeches heads of big American copper firms have made it clear that they still believe in selling copper at fixed prices to ward off the danger of substitution. They not only do not want a free market; many of them do not understand what a free market is, and would certainly not subscribe to the view expressed in these columns three weeks ago that the quickest way to bring the price down would be to leave it entirely free to go up.

If there has been no evidence of a fundamental change of view, the new selling policy will still have practical significance more especially if Kennecott fall into line. In the first place, Chile will get, immediately, a higher income. That proportion of her copper now going to the United States—somewhere between 30 and 40 per cent it is believed—will be roughly as remunerative as that sold in Europe. That will obviously lead to some switching of supplies from Europe to the United States, although probably a switch cannot begin before the second half of this year because of the need for honouring current contracts (and who will prophecy the price structure at that time?). Furthermore, the switch need not be drastic. Chile will not want to lose contact with European consumers nor will the American producers want to see London so starved of metal that the L.M.E. price will be forced sharply up to attract supplies.

Secondly, the changeover should bring nearer the time when a world downturn in copper—which all but the Chileans really want—can come about. The American policy of selling copper cheap has tended to perpetuate the tightness of supplies. It is precisely because consumers have been able to get a fair proportion of their copper at 46 c. that they can afford to pay 54 c. for their odd lots. Now the proportion of dearer copper will be rather greater and the pressure to pare demand will be that much the more. This pressure should affect almost all American consumers, for the big producers have been selling copper at 46 c. to non-integrated fabricators as well as to their own subsidiaries. Obviously, to hog the cheaper copper for themselves would have done the big producers no good for they do not want to drive out of business fabricators who, if rivals to their subsidiaries, are yet essential outlets for their primary production. It will be recalled that Revere Copper and Brass recently raised its prices to a basis of 49 c. for virgin metal so that, albeit independent, it must have been getting quite a bit of copper at 46 c. Thus all American consumers are likely to feel this new pressure on costs.

Lastly, the changeover must quicken the day for a fresh rise in the R.S.T. quotation. Mr. Prain's rather sophisticated world price—the weighted average of prices at which copper is actually sold—will have taken a jump upwards, and R.S.T.'s price must surely in logic do likewise.

One final matter is worth consideration—the position of Chile. It has already been pointed out that, though under the new copper law the American companies were given the right to sell their own production, the law has been

so interpreted as to give the Copper Department a strong influence on selling policy. What will Chile do when the long awaited downturn in copper comes about? For it is reasonably certain that when it does come the L.M.E. will lead the way—that, anyway would be its logical function. But the downturn may not be far off. Given freedom from strikes, and a continuation of the European credit squeeze it must appear this year, and could conceivably appear in a couple of months. It is more than likely that the Chileans would then wish to abandon the L.M.E. price and revert to the E. & M.J. price if that were to decline more gradually. Indeed it is not impossible that, if the downturn is but a month or so off, the Americans can see here an opportunity of teaching the Chileans a lesson on the merits of price fixing so that they will be less likely in future to wander from the fold of the righteous. Whatever the future of world copper pricing, it is not going to be a dull subject.

Koepe Hoists in Metal Mines

The evolution of winding engines from the horse drawn Cog and Rung Gin of the early 17th century to the modern multi-thousand h.p. electric hoists has traced a pattern of steady development indicative of the importance of the final stage in underground mining. As mines get deeper and pay loads increase the provision of high capacity hoisting equipment is receiving increasing attention and mining engineers the world over are giving serious consideration to the undoubted potentialities of friction sheave winding. Although friction sheave winding—or Koepe winding as it is frequently termed— is traditionally associated with coal mining, the swing towards this system is gaining impetus in the metalliferous mining industry. Scandinavian experience amply demonstrated the usefulness of single sheave winding at depths formerly considered too shallow for friction hoists and the succesful introduction of multi-rope friction winders at deep mines has stimulated universal interest.

Representative of the current trends in hoisting are the developments now taking shape in South Africa. These trends will be discussed in a series of articles to be published in successive issues of *The Mining Journal* commencing this week. Although at the present time friction sheave winders on metal mines are scarce enough to be curiosities the future may well show that this system will have as big an impact upon hoisting techniques as did the introduction of electricity in the steam winding era.

Need for Foreign Capital in the East

The measure of successful progress achieved by Eastern countries towards self determination must eventually determine whether or not the expanding industries of the West will be able to rely upon uninterrupted supplies of metals. Economic and political development in the East thus remains a matter of the greatest importance.

If it achieved little else, the Bandung Conference held in April last year—providing as it did a forum for discussion between 29 Asian and African powers—spotlighted the enormous industrial expansion which has taken place in this area since the war. Generally speaking, these development plans have not been put into effect without causing some overstrain to the economies of the countries concerned. The inflation which consequently emerged has naturally had, in many cases, an adverse effect on the balance of payments position.

Amongst the many reasons for the difficulties which have arisen, perhaps the over-ambitious rate of development undertaken is the most prominent. Yet had foreign investment funds and foreign technicians been readily available, these problems could perhaps have been avoided. Although a great deal has been said by politicians regarding fair treatment for foreign capital, insufficient practical efforts have in fact been made to provide the stable conditions under which it would be attracted and held. It is possible also that similar considerations have militated against the emigration of much needed trained personnel.

Of the many countries reviewed by Mr. C. Blaker in his statement to shareholders of the Hongkong and Shanghai Banking Corporation, that concerning India seemed to provide the best example of the political and economic pitfalls facing Eastern industrial expansion. In its essentials Mr. Blaker's comments appeared to differ very little from those of Mr. J. K. Michie, chairman of the National Bank of India.

Little doubt is in fact left by either view as to India's political objectives. Indeed, by expressing her intention of developing on a socialistic pattern, involving *inter alia* a more equal distribution of wealth India has clearly affirmed that the power of the State will soon increase. While it is scarcely the place of the outside world to criticize the adoption of this particular method of government, experience has shown that the investment climate likely to be created under such conditions will hardly be conducive towards attracting large scale foreign capital investment which is so badly needed. In this connection 83 per cent of all foreign investments in India at the end of 1953 came from the United Kingdom.

Some idea of the immensity of the second five year plan being adopted by India may readily be gained from the few figures as yet available. The plan will be financed as to 50 per cent from budget surpluses and loans while £900,000,000 will come from deficit financing. A total of £600,000,000 is expected from foreign sources leaving a gap of £300,000,000 to be filled.

It is, perhaps, the £600,000,000 from "foreign sources" which will arouse the greatest interest. As the Government are apparently "expecting" so large a contribution from overseas, it is perhaps a little surprising that it took upon itself to nationalize the Life Insurance industry during the past year. The reason for this decision, which has created severe uncertainty in both the minds of Indian and foreign industrialists—was unsatisfactorily stated as the necessity of channelling growing funds from this source more directly into the five year plan. It is at present too early to speculate on how India's proposals to raise so large an amount of capital abroad will be received. But as Mr. Blaker has said it is probable that in the future the role of foreign private investment in India will be smaller than in the past. Rather, the emphasis on foreign investment as a whole is more likely to be on a government to government basis.

Canada Establishes Free Gold Market

The liberalization of gold trading, which has made rapid headway in Europe since the reopening of the London bullion market in March, 1954, has at last spread across the Atlantic. For the first time in 25 years the Canadian Government has removed all restrictions on the sale and export of gold, thus opening the way for the creation of a free market in the Dominion. This development is unlikely to have many repercussions in the London market, where only small quantities of Canadian gold have been on offer in recent months. It might conceivably be the prelude to a further reduction in the Government's subsidies to the gold mining industry, which were cut by about $5,000,000 a little over a year ago, when they were restricted to gold mines with production costs above $26.50 an ounce. In this connection it is also noteworthy that the minting of gold coins for general circulation is under consideration by the Canadian Government, as reported in our issue of March 9, resulting in a premium which would, in effect, free the price from the "artificial" level set by the U.S.

Western United States

(From Our Own Correspondent)

Portland, Oregon, February 28.

Some concern is felt over that part of the President's budget message in which he calls attention to the fact that a number of the goals of the strategic stockpile programme have been reached or are approaching fulfilment, also that the Government has been obliged to divert a number of its quarterly quotas to industry to meet the demands of the rapidly expanding economy. Thus the 1957 budget carries no provision for funds for stockpiles or expansion of defense production. According to Dr. Arthur S. Flemming, director of O.D.M., $700,000,000 was spent on the stockpile in calendar 1955, major items being tungsten, nickel, tin and manganese. It should be noted that the strategic stockpile is distinct from the economic stockpile that was set up in 1954 to afford relief to the lead-zinc industry. The latter has no definite limits either as to tonnage or time. The Department of Agriculture reports that it is considering expanding its barter programme by which surplus agricultural products are exchanged with friendly nations for strategic minerals and other materials. During the first quarter of the fiscal year 1956 materials valued at $26,000,000 were received under barter agreements.

In view of the tight situation in metals O.D.M. has authorized suspension of all copper deliveries due to the Government during the first quarter of 1956, estimated at 14,000 tons, and the diversion to industry of an estimated 6,000 tons of nickel for the same period.

There seem to be indications of a tendency on the part of officials toward relaxing strict enforcement of the act which prohibits an individual holding more than $100 in gold coin. Optimists hope this may presage a gradual change in attitude and eventually lead to a free market for gold. But if such a move does come it is not likely to be in the near future.

THE LABOUR POSITION

As forecast recently (Notes and Comments, January 13, 1956), a "little merger" to take in the independent unions left out of the recent consolidation of AFL and CIO is in the making. On February 11, representatives of the National Independent Union Council and the Confederated Unions of America met in Washington and agreed to draft a constitution for a merger and to submit it to a joint convention to be held in Chicago, September 26. The two organizations claim a membership of 2,250,000 and hope to bring into the new union the greater part of those who are now members of independent unions or who have no union affiliation, with the expectation of an ultimate total enrollment of 6,000,000. Such a federation might be a haven for unions like Mine, Mill and Smelter Workers which has been rejected by the larger union because of its undesirable policies.

AFL-CIO apparently means business in setting and maintaining a high standard of policy. It has established a top level Ethical Practices Committee to oversee the actions of the various constituent unions and is expected to move against any that may follow practices too close to the party line and to undertake the removal of undesirable officials.

As noted in the above article there are many problems to be ironed out by the new big union, not the least of which is that of concurrent representation by two unions, one formerly AFL and one CIO. Such a case arose recently at an election at Anaconda's new aluminium plant in Montana where Mine-Mill, which is very bitter toward CIO, withdrew and threw its support in with AFL, thus giving the latter the victory. The unfortunate thing is that in such disputes there is always the possibility of the employer being caught in the crossfire.

AEC has announced a change in policy in granting leases on withdrawn public lands and certain other areas under its control. Heretofore leases have been negotiated individually on the basis of the qualifications of the applicant. Under the new system leases specifying terms of operation, royalty, etc., will be offered for competitive bidding, the bidder offering the largest bonus getting the lease, the same policy of careful scrutiny of the lessee being followed. This is the practice that has been followed successfully in leasing oil lands since 1920. Leases will still be negotiated in special cases.

Australia

(From Our Own Correspondent)

Melbourne, February 29.

There is marked activity in the examination and securing of areas containing rutile, zircon and ilmenite along nearly 600 miles of the east coast, and this activity has extended to Western Australia. Production of rutile concentrate this year is expected to exceed 60,000 tons, and if a reasonable proportion of new enterprises results from the prospecting operations now proceeding, a period of overproduction may occur. Zircon is now heavily over-produced, and further expansion in the beach sand industry will make the position of zircon concentrate still worse.

American interests are taking options, and are demanding large rutile content in the areas offered to them. It is reported that National Lead Company of New York is planning to build a beach sand treatment plant at Port Macquarie, New South Wales, at a cost of £A670,000. Australasian Oil Exploration Ltd., which commenced the development of the Mary Kathleen uranium deposits in the Mount Isa-Cloncurry district, and in which it later joined forces with Rio Tinto Ltd., has taken up extensive beach sand areas along the Queensland coast, north of Brisbane, and is now boring the areas.

RENEWED SEARCH FOR OIL

There is renewed interest in the search for oil. In South Australia, Santos Ltd., drilling 35 miles north of Port Agusta, has obtained showings of oil at four horizons between 575 ft. and 776 ft. Samples submitted for examination have been reported as crude vaselines or petroleum containing small amounts of lighter hydrocarbon oils. No asphaltic substances have been found in the samples submitted, indicating that the oils are high grade paraffin crudes. Meanwhile, in Victoria, drilling on the Woodside Dome has located some showings of oil, together with gas, at depths in the range of 3,200 ft. The beds giving this evidence are reported as being sufficiently porous to form suitable storage for oil.

The results obtained by the Woodside (Lakes Entrance) Co. have caused a revival of interest in two other companies which held permits to drill on the Woodside Dome, but withdrew after the unfavourable data disclosed in the first Woodside bore. In New Guinea, interest centres in the work of Oil Search—Australasian Petroleum—Island Exploration at Kuru, where heavy gas was met at 900 ft. which could not be shut off. Consequently, a new bore is being drilled close to the first hole. Here again, there is strong evidence of confidence. These allied companies propose to spend £A3,500,000 during 1956. In Western Australia, West Australian Petroleum, which has already spent £A9,000,000 in the search at Exmouth Gulf, the Kimberley country, and Dirk Hartog Island, will spend a further £A4,000,000 in the State during the year.

Selling Mining Machinery Overseas

This is the second of two articles in which the possibility of expanding British mining machinery exports is discussed. The first article, which appeared in our issue of March 16, 1956, pp. 324 and 325, was concerned mainly with policy and long-term planning. Consideration is now given to the fundamental requirements of a successful export drive, such as market research and the organization of sales and service.

Enquiries by *The Mining Journal* have revealed a very wide diversity of views among commercial firms as to the problems encountered in selling mining machinery overseas and the requirements for a major attack on export markets. As might be expected, the views of individual manufacturers are conditioned to no small extent by such practical considerations as size of company and type of product, which obviously have an important bearing on sales organization and export policy. There is, however, a wide measure of agreement that far too little British mining machinery is exported. Not only is it desirable that the mining machinery industry should make the most effective contribution within its power to the export drive, which is basic to Britain's economy, but the expansion of production resulting from an extension of existing markets might be expected to have favourable effects on production costs. The National Coal Board itself should therefore benefit from a successful export drive.

The basic problems of expanding the mining machinery industry might be summarized as good, sound selling throughout the markets of the world, followed by reliable deliveries, competitive pricing, and, above all, first-class service, particularly in the matter of spares. The latter requirements are even more important than initial selling.

MARKET RESEARCH

It is generally agreed that surveys of overseas markets and mining methods are highly desirable in order that export sales campaigns may be based on adequate data, but conflicting views have been expressed to us as to the most suitable machinery for carrying them out. On the one hand, it is contended that no mining machinery manufacturer could possibly hope to visit all groups of mines throughout the world to find out what kinds of machines they are using, what kinds they might be able to use, and what forms of haulage they employ. Surveys undertaken by a representative working party of manufacturers could, therefore be of great help in tracking down the most likely sources of business.

In replying to our queries, the director of a firm well-known in the industry emphasized that a major marketing survey was overdue; in his opinion, very little research had been carried out in foreign markets in respect of mining machinery and equipment. Another school of thought—by no means confined to large firms—is convinced from experience that, by judicious advertising and active agents, an export market can best be built up by individual effort rather than through a co-operative one. Others again have a world-wide distributor organization which is in close touch with the needs of the mining industry, or consider that, so far as their particular type of product is concerned, the requirements of overseas users are sufficiently well known.

Analysis of the views expressed indicates the probability that a comprehensive market survey of all, or of certain specific overseas markets, would be of value to many firms interested in the export field, and that to be of maximum benefit to the industry as a whole it should be carried out by a representative working party, whose findings would be widely available. This might be done by utilizing the machinery for co-operative action which is available through existing manufacturers' organizations.

Knowledge of the conditions and requirements of a particular market, however acquired is clearly of basic importance to any exporter wishing to do business with that market, particularly where highly specialized equipment is involved. For example, Canada offers great and expanding potentialities as an outlet for British goods and has the additional attraction of being a dollar market. On both sides of the Atlantic vigorous attempts are being made to raise the level of U.K. imports to the Dominion. A Canadian Mining Mission has visited this country, while discussions took place recently in the Dominion between Canadian businessmen and a very strong delegation from Britain headed by Sir William Rootes, chairman of the Dollar Exports Council.

It has to be recognized, however, that coal mining conditions and techniques are rather different in the Dominion to those currently employed in Britain. This by no means implies that the U.K. cannot supply Canada with coal mining equipment, but it does follow that success cannot be achieved by regarding the Dominion merely as an extension of the home market—a mistake which has, on occasion, been made in the past by some British exporters of consumer goods. This observation is, of course, applicable not only to Canada but to all overseas markets, to a varying degree.

One of the foremost objectives of market surveys, however organized, should be to ascertain the prices and delivery times offered by manufacturers in other countries, so that our own exporters know precisely what competition they will have to meet. We have been given to understand by certain mining companies in the Union of South Africa, whose outlook by tradition and inclination is wholly favourable to British Goods, that important orders for heavy electrical and other mining equipment have been going to Germany, Switzerland and Scandinavia, more especially where public expenditure is concerned, through failure of British manufacturers to be competitive in price and deliveries. No doubt the situation would be very much worse but for the personal goodwill towards British suppliers in the South African mining industry, based on personal relations over a long period, and good after sales service.

EXPORT SALES AND SERVICE

One of the encouraging features of British export trade is the success which has been achieved by relatively small firms with limited capital, some of whom are exporting a high percentage of their production overseas. Unfortunately a manufacturer with limited resources is in no position to set up a world-wide service organization.

In this connection it has to be remembered that in many parts of the world the distances to be covered are vast indeed. This consideration applies very forcibly to Canada which because of its dollar currency is a particularly desirable market for British exporters. Quite a large proportion of the Dominion's mines, other than local coal mines in Ontario and Quebec, are situated in remote areas of Northern Canada, in the Yukon, and in the vicinity of the Great Bear Lake and Great Slave Lake in the North West Territories. These are all regions so far from the

beaten track that the director of the average British manufacturing firm on a brief sales visit to Canada has not time to cover them.

One of Britain's leading export organizations attributes its success in the supply of equipment to mines in these far-off territories to the fact that the engineering staffs of its agents—particularly those in Toronto—have become well acquainted with Canadian problems and have paid frequent visits even to the most inaccessible areas. U.S. firms have the advantage of being very much closer to these territories, however, and have a much greater number of engineers, salesmen and mining experts touring Canada at any one time.

Another difficulty is that many of the largest mining companies are either wholly American-owned or have a preponderance of U.S. capital, and in many instances are manned by U.S. engineers. In such cases there is naturally a strong tendency to purchase mining equipment in the U.S.

IMPORTANCE OF SALES SERVICING

A point made in the previous article was that when purchasing imported equipment the National Coal Board is liable to be put to the expense and inconvenience of organizing its own service facilities, which may include the manufacture of spares. For the same reason, large undertakings in other countries are likely to look very closely into the question of after-sales service when ordering imported equipment.

Sales servicing in export markets can be a costly business, particularly in the initial stages. Some manufacturers of mining equipment see attractive possibilities, both for individual firms and for the industry as a whole, in the establishment of joint export sales and service organizations by groups of non-competitive firms. This tentative suggestion was warmly supported by a specialist firm which at present is operating through agents in the principal mining territories, backed by occasional visits from its staff—a method of working regarded as by no means ideal. Since its range of products for mining use is not in itself a very wide one, this company cannot maintain its own sales/service organization. It would therefore be interested in collaborating with other British manufacturers of complementary and non-competitive plant who find themselves in a similiar position.

Experience has shown the desirability of direct personal contact between the principal and the agent he appoints, since it is often difficult to obtain a sufficiently close understanding by correspondence alone, and it is evident that this presents considerable difficulties to all but the larger organizations. One small firm supplying the metal mining industry in the United Kingdom with ore separation equipment believes that a wide field must exist overseas for the type of equipment on which it concentrates, but owing to the difficulty of obtaining more staff, considers it inadvisable to compete for additional business overseas. While the existence of a joint sales organization would not solve staff difficulties on the manufacturing side, it should overcome some, at least, of the marketing problems which may discourage small firms from entering the export field.

At the other extreme is a leading firm of manufacturers and exporters which is represented all over the free world, but conducts its relations with Iron Curtain countries through a liaison representative attached to its London Office. In major markets it has its own subsidiary companies or branches; elsewhere, in important areas, it has its own representatives attached to agents, and where there is not a representative attached to and resident with an overseas aegnt, there is a representative who covers a small number of adjacent countries. This, clearly, is the type of organization which is ideally desirable, whether set up jcintly by a group of exporters or by a single large concern.

Into a different category come suppliers of certain items of capital equipment such as locomotives which are bought at long intervals but frequently in large quantities at certain times. In these circumstances export arrangements must be flexible, since it is most difficult to get agents in all countries for a market which is spasmodic and does not provide a steady annual income for the agent.

Setting up the sales organization is a straightforward commercial matter, but in order to live up to short delivery promises forced by foreign competition and supply good service, the exporter requires dependable deliveries of materials and components from his own suppliers, and complications are sometimes presented by problems arising from the present conditions of full employment. These are difficulties which must be overcome.

At the moment the basic materials—light alloys, castings, forgings, ball races, etc.—are steadily lengthening in delivery times, while increases in wages or material costs are automatically passed on to the end product manufacturer without regard to their impact on overseas markets. The expansion of overseas sales on any worthwhile scale seems to call, therefore, for a co-operative attack not only by the makers of the end products but also by the materials and secondary manufacturing sections of the engineering industry, whose own businesses must inevitably benefit from increased sales of mining machinery abroad, even though they are not direct exporters.

Here again, more precise information of the N.C.B.'s forward requirements would be helpful. Under present conditions most component manufacturers have no difficulty in selling their entire output and in some instances deliveries are in the region of 9/10 months from receipt of orders. Firms with no provision in their factory for carrying stocks can only manufacture against firm orders and are in no position to cater for fluctuating demands arising from any sudden rise or fall in the volume of N.C.B. orders. A more stable demand might be expected to result in quicker and more dependable deliveries, with favourable consequences throughout the home and export trades.

Although the upward trend in production costs is among the most disturbing aspects of Britain's present-day economy, the answers to our queries regarding sales and servicing costs have been mainly encouraging. One of the firms contacted—whose reply may be regarded as broadly typical—has found from experience that its product, under independent tests, compares favourably with competitive equipment and its prices are sufficiently keen to win business from many countries. In giving this information, however, the managing director added that, were the N.C.B. able to provide a background of work for the home market, the company's competitive position overseas would be immeasurably improved.

NEED FOR CONCERTED ACTION

Summarizing the results of our enquiries, we are satisfied that manufacturers of mining machinery are becoming increasingly interested in selling their products overseas and that an export drive would be favourably viewed by the National Coal Board and the Government Departments concerned. We have attempted to indicate some of the basic problems and the scope which exists for co-operation between the Government and the industry and within the industry itself. It seems considerable discussion is needed before an acceptable programme for action can emerge.

The time and cost involved in laying the foundations of successful exporting seem to point to the desirability of incentive in the form of suitable taxation relief—a consideration which, of course, is applicable to export policy as a whole.

KOEPE SYSTEM IN SOUTH AFRICAN GOLD MINES—I.

Koepe Hoisting System in the Rand and O.F.S.

The limitations of presently employed hoisting systems on the Witwatersrand and Orange Free State gold fields have resulted in an examination and the subsequent employment of the Koepe hoisting system. Although that system hitherto has been neglected or considered unsuitable for these fields, changes in mining methods and improved hoist design show these friction hoists, particularly the multi-rope types, to have advantages over other hoist systems. The following article is the first of a series which discusses the application of the Koepe hoist to the Witwatersrand and Orange Free State goldfields. The article is condensed from a paper presented at the monthly general meeting of the South African Institution of Mechanical Engineers on January 12, 1956, by L. T. Campbell Pitt, O.B.E., M.I.Mech.E., a Past President of the Institution, and F. G. Zeppenfeld and A. W. P. Hallett, M.A. (Cantab.), M.I.Mech.E., members. In the first portion of the article appearing herewith, South African methods of shaft sinking in relation to the Koepe hoist are described while subsequent articles will discuss the limiting effect of rope strength on Koepe installations and the capacity of Koepe and drum winders respectively.

In the early days of mining gold on the Witwatersrand small tonnages were obtained from ore at shallow depths and, as outcrop workings reached economic limits, they were replaced by incline shafts which could develop the gold bearing reefs as the shafts followed them down, level by level.

As it became expedient to mine at greater depths below the surface, vertical replaced the incline shafts. In some cases a hybrid compound shaft was sunk which started as a vertical and then changed to an incline shaft to follow the orebody when it was reached and so enable the mine to be developed as production was maintained. Compound shafts did impose major hoisting restrictions, and they have not been sunk for many years, while many have been converted to two separate hoisting shafts, i.e., a vertical surface shaft and a sub-incline shaft.

Incline shafts are nowadays seldom sunk as main surface shafts but are not uncommon as sub-shafts, and in most cases, their hoisting duty is comparatively small. They are best served by drum winders.

Vertical shafts have become the main shafts from surface with few, if any, exceptions, and vertical sub-shafts, particularly those of high hoisting capacity, are often provided. Many surface shafts have depths of over 6,000 ft. From these large hoisting capacities are often required. The table below gives some details of recent shafts sunk and planned. From their cost it will be appreciated that the maximum use must be obtained from such costly highways.

HOISTING CAPACITY

The shaft is designed to give a desired duty in hoisting, ventilation, and the provision of a duct from surface to underground workings for pipes and cables each in predetermined capacities. Since a shaft is a costly part of the mine, it is not larger than necessary. The space allotted to hoisting as for other duties must therefore be economically used. The authors have found from experience that the average rock hoisting capacity of a shaft on a gold mine in these fields may be taken as one-third the sum of the capacity of all hoists with which that shaft is equipped. The other two-thirds are occupied in lowering and hoisting persons, materials and equipment, examination of shaft and hoisting equipment, driver's rest periods, and also various other shaft operational delays. That is an average for shafts equipped with manually operated hoists. The hoisting cycle is, apart from the conveyance capacity, the factor that determines the useful work done in the working period. This applies to all hoists, whatever the system. The hoisting cycle is made up of a loading and unloading period, acceleration and deceleration periods, and the full speed period.

In all but the cases where rock is hoisted in cars—which is unusual in these fields—unloading is automatic. Loading is manually operated or initiated and speed of loading depends on the efficient design of the loading equipment. The acceleration and deceleration is usually at a designed maximum rate of 3 ft. per sec.per sec. This appears to be an economic rate from the points of view of design of equipment and power demand.

DESIGN AND CAPACITY OF CONVEYANCES

In practice, when manually operated, the hoist is driven within the designed cycle or that limited by shadowing protective devices. The human factor reduces hoisting capacity. There is justification in rock hoisting for installing automatic or semi-automatic winding. By semi-automatic is meant that each trip is initiated by the loader or skipman. It is questionable whether fully automatic loading and hoisting is justified. At the present time, the authors do not visualize rock hoisting without human loading attendance on gold mines. If a man is required to be at the loading point his attention is better maintained if he is responsible for initiating loading for each hoist trip. Efficiency of loading does not entirely depend, of course, on design of equipment but on the conditions at the loading point where there should be good light, ventilation and adequate room

COSTS OF SOME VERTICAL SHAFTS COMPLETED ON THE WITWATERSRAND AND ORANGE FREE STATE SINCE 1945*

Shaft No.	*Surface/Sub*	*Lined/Unlined*	*Shape*	*Size*	*Depth B.C.*	*No. Hoists*	*Purpose*	*Approx. Cost (£000)*
1	Surface	Unlined	Rectangular	36′ 0″ x 12′ 6″	5,098	3	Dual-Purpose	557
2	Sub	Lined	Circular	22′ 6″	3,100	1	Dual-Purpose	191
3	Surface	Part	Rectangular	29′ 6″ x 11′ 6″	1,353	3	2 Dual/1 Service	200
4	Surface	Part	Rectangular	43′ 6″ x 12′ 6″	3,146	2	1 Dual/1 Rock	494
5	Sub	Lined	Elliptical	35′ 0″ x 15′ 0″	4,714	1	Dual-Purpose	690
6	Surface	Part	Rectangular	46′ 0″ x 10′ 0″	5,475	3	1 Service	893
7	Surface	Lined	Circular	18′ 0″	5,075	—	—	475
8	Surface	Lined	Elliptical	33′ 0″ x 16′ 6″	6,662	2	Dual-Purpose	698
9	Sub	Unlined	Rectangular	18′ 0″ x 10′ 6″	2,134	1	Dual-Purpose	136
10	Surface	Lined	Circular	22′ 0″	4,736	2	1 Rock/1 Man	531
11	Surface	Lined	Circular	24′ 0″	6,810	1	Dual-Purpose	646
12	Surface	Lined	Rectangular	47′ 0″ x 11′ 0″	5,778	3	1 Service	1,211.3

* These costs include sinking, cementation, lining, buntons and guides or, in the case of timbered shafts, timber and guides. The costs of surface equipment and underground loading arrangements have not been included because they vary considerably with the purpose of the shaft.

for operation and maintenance.

The design of the conveyance, whether it be cage or skip, can have a great variation to suit the needs of capacity and available compartment sizes. In general, however, the Koepe hoist permits of larger loads and, consequently the tipping skip reaches proportions that make automatic tipping undesirable. The bottom discharge skip is preferable for such duties. It has many advantages over the tipping skip in that it can be fixed to the bridle and results in a more rigid assembly ; it can be deep and so save space in the shaft cross section ; by giving extra free board on sides adjacent and, if necessary, opposite to the loading side, spillage can be reduced ; the automatic door opening arrangements cause less stress to the whole equipment including ropes, skip and headframe, than does a tipping skip. Moreover, it empties better than a tipping skip which—particularly with sticky ores—often retains a portion in the skip pan, whereas the bottom discharge skip empties completely and thereby maintains better pay-load efficiency or skip factor. The bottom discharge skip requires well designed doors since leakage in any shaft. particularly in the case of downcast shafts, is serious because leaked slime becomes silica dust when the slime dries.

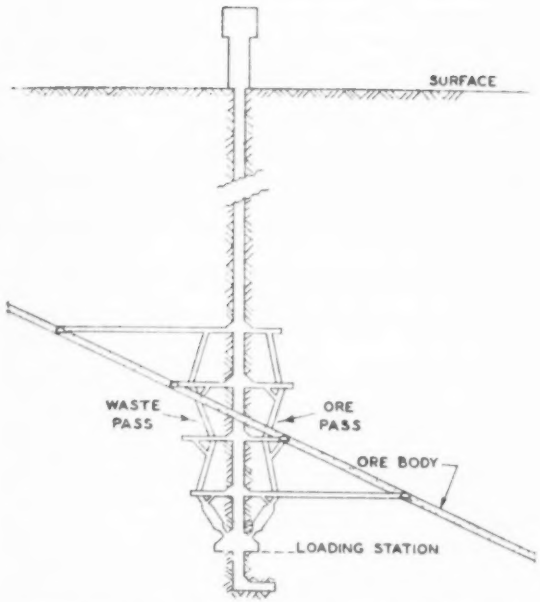
The conveyance capacity depends on the rope. For a given rope specification the pay load capacity of the rope decreases beyond the critical depth. Increases of rope size impose practical restrictions if not technical restrictions when deep shafts and, consequently, large ropes become necessary. The authors feel that a rope 2¼ in. dia., weighing 8.25 lb. per ft. is as large as is economically practical. Increased shaft capacity, then, means increase of rope size to these limits and thereafter an increase in the number of ropes. Since drum winders can at the most be equipped with only one rope per conveyance, it seems necessary to examine other hoisting systems.

THE KOEPE HOIST

This system is named after Carl Fredrich Koepe, who installed one at Hanover Colliery, near Bochum in Germany, in 1878. Since the early part of this century this type of winder has been adopted almost exclusively on the coal fields of the Ruhr, Saar Valley, the Limburg District in Holland and in Belgium. Observations on those mining fields and of more recent installations at the iron ore mines of Sweden have supported the opinion that this system of winding could with advantage be applied in many cases to new installations on the Witwatersrand mines, particularly as most of the main vertical shafts of to-day are designed and developed for raising ore or waste rock from one main loading level.

Friction winding is not confined to a single rope system. A number of ropes can be driven from one drum. Therefore, for a given load the individual rope diameters may be reduced by increasing the number of ropes, which will enable the drum diameter to be reduced ; or by increasing the number of ropes and retaining the same diameter the skip and cage size may be increased. If there was not at present a complication in the permissible factor of safety being considerably larger for Koepe ropes than for drum winder ropes, the advantage would be in direct proportion. Ropes do not require to fleet across a drum or to be coiled in layers. In doing so the coils rub against each other and thereby cause wear. Finally the hoist is simpler than the drum winder.

The disadvantages of the system include the following considerations. Regarding slip it can be shown that on a well designed hoist with properly controlled acceleration and deceleration and with well designed rope treads there is no slip. In fact, creep is more common. Balance ropes are not desirable but they are, unfortunately, a necessary



Passes terminating at a loading station at the shaft bottom

part of the Koepe system. They have, however, the advantage of reducing peak power demands. This could, of course, be obtained by fitting balance ropes to drum winders.

Two conveyances cannot be used in balance to serve an unloading and more than one loading point, but in most mines single level rock loading has been adopted. Rock is delivered from the working faces to an ore or waste pass system on all working levels. These are passes which terminate at a loading station at the shaft bottom.

Men and material must be delivered to a number of levels. If the upper station or, say, the surface, can be arranged at the same distance below the tip as the rock loading point is below the bottom station, then rock can be hoisted and men and material lowered and hoisted between the surface and the bottom station.

It is an advantage to instal cages with large deck area to facilitate lowering and raising equipment such as trucks, locomotives, loaders, timber, etc. If one of these is installed and balanced to the best advantage, i.e., counterweight equal to the weight of the conveyance plus half its contents, then all levels may be served. Further, it can be arranged that the counterweight can be designed to serve also as a pipe service cage.

TESTING AND INSPECTION OF ROPES

Regarding testing and inspection of ropes it is true that the usual test specimen cannot be cut but it is felt that the periodic sample is credited with more importance than it deserves. The authors consider that examination of the whole rope by a qualified and experienced engineer to be much more effective. Moreover, non-destructive testing and examination methods are advancing so rapidly that in a comparatively short time they feel sure that the non-destructive method will be relied on to a much greater extent than the present destructive tests of a small specimen from the one end of the rope.

This method will greatly assist the effectiveness of the inspection by the engineer and will permit an examination

far more informative than present less aided examinations. Until that time comes the authors feel that an increased factor of safety for Koepe hoist ropes covers any lack of test and examination information that guide the engineer in his assessment of the condition of the rope.

HOISTING ROPES

The stranded rope is universally used in these fields. The lock coil rope has been popular for drum winder use overseas for a number of years and, in recent years, is being more often installed on large single rope Koepe hoists. It is claimed that the closer contact of a lock coil rope with a Koepe driving wheel gives a better friction drive than with a stranded rope which tends to roll and by variations in the pitch of lay during its life, run out of mesh with impressions already made in the wheel tread.

From an economic point of view and a service one it is better to use ropes that are made in South Africa. At present only stranded ropes are manufactured in this country and so, while this is the case, it is intended to use stranded ropes on Koepe hoists. The authors see no reason to depart from the triangular strand Lang's lay construction generally used on drum winders. Ropes of wire drawn to an ultimate tensile strength of up to 145 tons (2,000 lb.) p.s.i. should give a satisfactory life. Ropes of 140/145 tons p.s.i. have given good service on drum winders where rope flexing, crushing, and wear, are much greater than is possible in the case of ropes on Koepe hoists.

In the case of multi rope Koepe hoists it is advisable to have adjacent ropes laid to opposite hand to cancel out the effect of rope twist on the conveyance.

It is common practice in Europe to use flat ropes for balance purposes. For deep surface and sub-shafts the transport and handling of flat ropes may be more troublesome than for round ropes. A non-spin round rope construction would therefore have advantages. The lock coil construction is a non-spin rope and is worthy of consideration for balance ropes. It is understood that this construction is being used for this purpose in Britain. The minimum loop diameter from a freely hung non-spin rope does not appear to be appreciably greater than that of a similarly obtained loop from a flat rope of equal weight per foot.

Round ropes are a better construction from the point of view of protection against corrosion. They are of a closer construction, can be more easily greased, and are not prone to holding water and spillage, particularly in the loop when the hoist is stationary.

FOCAL POINT OF CORROSION

Stationary loop positions, i.e., when the hoist is at each end of its trip, are the points of heaviest corrosion of balance ropes. The authors assume that the rope will not pass round a tail sheave. Tail sheaves tend to cause spin in round balance ropes and no instance of a flat balance rope passing round a sheave is known to the authors. The tail sheave is, in any case, unnecessary. Timber baulks are fitted in the shaft around which the rope loops and thereby prevents a possibility of the rope twisting on itself. For multi rope hoists more than one balance rope is preferable since a single rope would be heavy to transport and might have too large a loop.

Indonesia's Five-year Plan Favours Mining

A five-year plan for national construction was presented by the Indonesian Government to the Colombo Plan meeting held at Singapore in October, 1955. The plan is designed to speed up economic development and increase national production in order to raise the standard of living. It is expected to cost Rp.11.4 milliard and will be submitted to Parliament after approval by the Cabinet. First priority will be given to the development of all forms of power, especially hydro-electric, which will consume some 25 per cent of the money available for implementation of the plan. Mining and industry will be allocated a further 25 per cent, communications 25 per cent, agriculture 13 per cent, and social affairs 12 per cent.

To ensure continuity of activities and avoid duplication of effort, drafts and proposals prepared by the various Ministries and Government agencies were submitted to a State Planning Bureau for thorough examination, one of the aims being to avoid unnecessary spending of capital. The five-year construction plan is based on this examination and will be embarked upon during the coming year.

AIMS AND METHODS

Among the projects forming the first stage of execution of the plan are the establishment of an iron and steel industry and expansion of the national shipping company PELNI, both of which will need more than five years to complete. For the time being the State has considered it desirable to undertake the setting up of various important enterprises, such as a cement factory at Gresik, which really belongs to the private sector.

According to Dr. Djuanda, head of the Indonesian State Planning Bureau, the problem of security does not form too big an obstacle to the execution of the plan. In the Celebes, for example, the Government hopes that an improvement in the security position will allow a search for nickel and iron ore in the interior.

The Government desires to attract capital to Indonesia from abroad, either in the form of foreign loans or as direct private investments. It aims at providing conditions that are attractive to foreign capital, while ensuring that the interests of the Indonesian people will not be harmed. In principle, national private capital is free to operate in any sector of the national economy, other than those reserved for the State. Foreign capital can operate in all sectors not reserved for the State or for Indonesian nationals. Utilities serving specific social and public interests, which cannot be completely entrusted to private initiative, may only be operated by the State. They include railways, electric power plants, water supply installations and atomic plants. Small-scale industries that are Indonesian by tradition are not open to foreign capital.

Foreign enterpreneurs will not be allowed to own more than 49 per cent of the shares in enterprises which by their nature may greatly influence the further economic development of the country.

Permission to establish new enterprises will readily be granted if the Government is satisfied that the enterprise is a sound one. In principle, enterprises will be permitted to employ the necessary foreign staff, but regulations designed to promote the employment of Indonesians will be introduced.

Endeavours will be made to bring about international agreements for the avoidance of multiple taxation. Arrangements will also be made that certain exemptions—such as special reduced levies on capital goods, relief from import duties on equipment and materials, etc., will also apply to foreign enterprises which have been established after January 1, 1950.

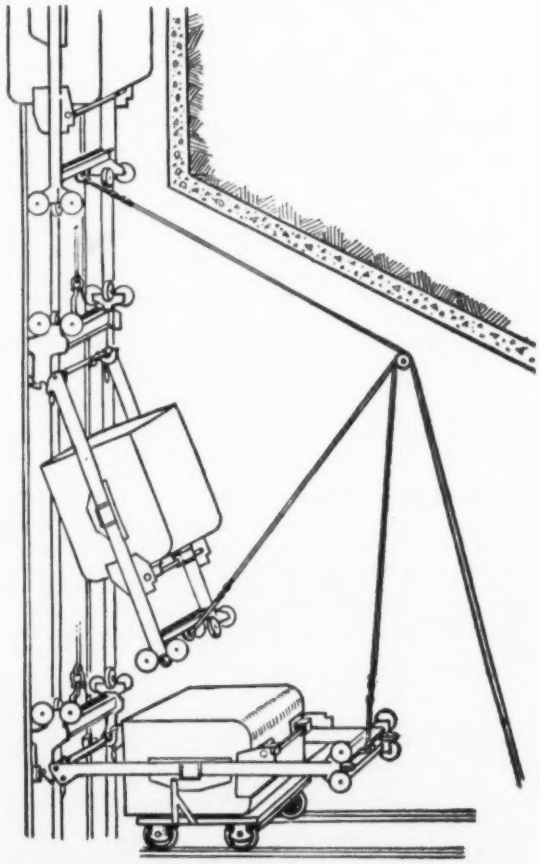
Skip and Cage Changing in Vertical Mine Shafts in South Africa

On many mines it has been found desirable to render interchangeable the skips and cages operating in vertical shafts, so that substitution from man to materials hoisting can take place with the minimum time lag and the greatest possible tonnage of rock hoisted in the working period. The following article, condensed from *Optima*, Vol. 6 No. 1, a quarterly review published by Anglo American Corporation of South Africa, describes the method of operation o the Blair crosshead whereby cages and skips are removed from a shaft each complete with its own bridle. The device has proved particularly effective at the S. African Lands and Exploration Co.

There are various methods of interchanging the skips and cages in a shaft. In one method, the skip or cage is removed from the winding rope in one unit—that is, the conveyance complete with its own bridle, in which it is mounted, and the crosshead to which the winding rope is attached.

ADVANTAGES AND DISADVANTAGES

Use of this method has two advantages: the conveyance can be designed to make full use of the available width between the guide rails in the shaft compartment, and the change-over can be carried out relatively quickly and easily. The chief difficulty in using this method is that, when the conveyance is disconnected from the winding rope, special precautions must be taken to prevent the twist of the rope (known as "spin") from changing as soon as the load is removed. This is particularly important when it is necessary to make the changeover at some point far below the surface, where the rope is extended and is bearing not only the weight of the conveyance but its own weight as well.



The three stages of skip removal by use of Blair Crosshead.

Another method, often used, overcomes this difficulty by making the conveyance detachable from the bridle and crosshead, which remain attached to the winding rope. But against the advantage that no provision has to be made to prevent rope "spin", there are certain disadvantages. One of the most important is that the number of persons that can be carried on each trip is reduced; this is because the cage must be limited to a size that will allow sufficient clearance inside the bridle for interchanging conveyances; and, since the bridle needed for a cage is usually longer than that needed to hold a skip, the long fixed bridle represents extra weight, thus limiting the permissible load.

Some time ago the Consulting Mechanical Engineering Department of the Anglo American Corporation of South Africa designed a device, known as the Blair Crosshead, that elminates these and other mechanical difficulties in changing skips and cages. Apart from a number of other features, the basic principle of the Blair Crosshead is that the crosshead remains attached to the winding rope, and the skips and cages are removed each complete with its own bridle. This means that the cages can be built to occupy the full space within the arms of the bridle, thus increasing the capacity of the cage; and bridles, being designed specifically for either skips or cages, do not offer any unnecessary weight, which means that the number of persons travelling can be increased without exceeding the total permissible load on the hoist.

STAGES OF SKIP REMOVAL

The accompanying diagram shows three stages in the removal of a skip from the shaft. In the highest position the skip is shown in its normal position in the shaft. It has, however, been prepared for removal from the shaft by opening hinged guides, freeing locking levers and engaging retractable auxiliary guide shoes. A wire rope, anchored at one end and passing over a pulley, has been attached to the skip to pull it automatically into the correct position for removal.

The conveyance is then lowered slowly, allowing it to swing out on the anchored rope (as seen in the middle position in the diagram), until it rests horizontally on a trolley (lowest position in the diagram). The main crosshead, still attached to the winding rope, is then lowered a little until it releases the conveyance from the hooks, and the conveyance is then moved away on the trolley. By reversing the procedure a cage can then be substituted for the skip that has just been removed.

The Blair Crosshead has been particularly valuable at the South African Land and Exploration Co. mine, where it has been in use in the sub-vertical shaft for more than a year. As the cross-sectional area of the shaft compartments is relatively small, this device has permitted the mine to hoist the maximum possible number of persons on each trip. Furthermore, there is insufficient space to install the changeover gear in the sub-vertical shaft at any point except at the lowest station, 2,240 ft. below the engine rooms at sub-bank level. Thus the absence of any difficulties with rope spin—which would be serious in any system that freed the winding rope each time a conveyance was changed—is of great advantage.

MACHINERY AND EQUIPMENT

The A.S.E.E. Exhibition, 1956

At the fifth Electrical Engineers (A.S.E.E.) Exhibition held from March 20 to March 24 at Earls Court, many of the exhibitors are displaying equipments of possible application within the mining industry.

On Stand M22 Heenan and Froude Ltd. show various applications of dynamatic couplings including a synchronized drive and a unit demonstrating constant speed reeling.

One demonstration unit is showing the possible uses of a coupling adapted as a brake and a torque limiting feature. It consists of a ¾ h.p. 1,440 r.p.m. single phase motor driving a small coupling which in turn will drive, by means of a vee-rope, another small coupling adapted as a brake. A reeling drive unit shown demonstrates constant speed reeling, controlled back tension braking on unreeling drives and suitability for adaption to automatic processes, while another unit demonstrates the absolute synchronizing of two independent drives by electronic control.

Newman Industries Ltd. are showing a representative selection of electric motors on Stand H17. The exhibits here range from ⅛ h.p. "Elf" fractional-horsepower motors, to 120 h.p. slip-ring motors and includes those designed for specific duties such as flameproof, industrial, British standard dimension, and pump motors. Particular emphasis is being given to the manufacturers' range of flameproof motors designed to cover practically all requirements in the gas, petroleum, chemical and mining industries.

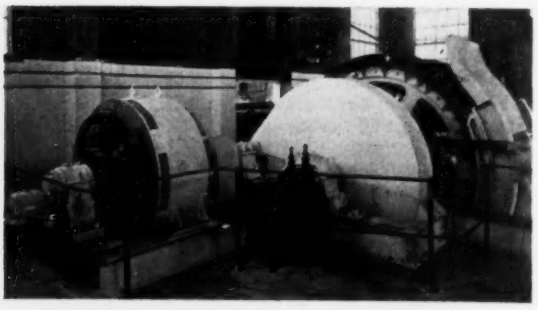
On Stand J11 British Insulated Callender's Cables Ltd. are exhibiting cables for transmission and distribution, telecommunication and high frequency cables, as well as cables for use in mines and quarries, mineral insulated cables, terminal boxes, bolted flameproof couplers and similar equipments.

Oldham and Son Ltd. are exhibiting a complete range of portable power and lighting equipment. This includes all the models which were on view at the Oldham stand last year, including cap lamps, inspection lamps, shunter lamps, torches and shaft signalling units in the mining industry.

Metropolitan-Vickers Electrical Co. Ltd. in 1955

During 1955 Metropolitan-Vickers Electrical Co. Ltd. maintained its service to the mining industry in many parts of the world.

In the U.K. the company is playing a major part in helping the N.C.B. to develop and establish multi-rope friction winding, a new technique in U.K. coalfields. The latest contracts received cover Ward-Leonard winders of this type ranging from 1,500 to 2,700 h.p. r.m.s. for U.K. collieries, while electrical equipment has also been ordered for a 4,300 h.p. four-rope friction winder for Stilfontein G.M., South Africa. A number of conventional drum winders have been ordered for mines in the U.K. and overseas, the export orders coming chiefly from South African mining houses and from Northern Rhodesia, and



At Monk Bretton Colliery the winder is geared to a 300 h.p. D.C. motor supplied by mercury arc rectifiers.

A 20 h.p. flameproof t.e.f.c. squirrel cage motor driving a Huwood conveyor in an N.C.B. colliery.

covering both A.C. and Ward-Leonard D.C. equipments ranging from 30 to 4,700 h.p.

During 1955 more than two dozen electric winders were shipped and twenty put into service. Early in the year a 3,630 h.p. single-rope Koepe winder with geared Ward-Leonard drive was commissioned at Bold Colliery (N.W. Division), the first Ward-Leonard winder equipment to employ closed loop control with mercury arc rectifiers on the generator fields, although others are on order.

A development of major interest took place at Monk Bretton in the N.E. Division, which is operating a 300 h.p. D.C. motor-driven winder with a mercury arc rectifier instead of the conventional m.g. set. During braking the rectifier operates as an inverter, returning power to the system.

Colliery electrical equipment of all types continues to be ordered for the N.C.B. and for overseas mining installations. Many flameproof squirrel cage motors of special types have been ordered; some 113 are for driving German-produced Lobbe Hobel coal ploughs and Panzer conveyors and Eickoff conveyors as well as for British conveyors manufactured by Crawley Industrial Products, and 68 for driving Duckbill reciprocating loader type conveyors made by Distington Engineering—a subsidiary of United Steel—for room-and-pillar working.

For cable belt conveyor installations, equipments at 300 h.p., 500 h.p. and at 170 h.p. have been supplied to various U.K. collieries. Thus in the East Midlands Division of the N.C.B. coal is now transported by cable belt conveyors instead of by haulages and smaller conveyors in series.

Among export orders, eleven 75 h.p. and twenty-one 45 h.p. type RW motors have been ordered by Yule Catto for driving haulages in Bengal coal mines. A considerable amount of equipment has also been ordered for application in the oil industry by such producers as Shell Petroleum and Trinidad Leaseholds.

A Range of Rotary Vacuum Filters

The rotary vacuum filters manufactured by Davey, Paxman and Co. Ltd. are presented as a means of continuously separating suspended solids from liquids and are described in an interesting brochure recently published by the company. The filter consists of a drum divided into a number of vacuum and pressure-tight cells which communicate with ports in the automatic valvehead. The drum is clothed with a filter medium such as cloth, gauze, synthetic fibre material and the like.

In operation, the drum is arranged to rotate partly submerged in the slurry to be filtered and speed of rotation is variable according to the material filtered. The application of a vacuum to the internal cells of the drum causes the solids in the slurry to be drawn against the filtering medium in the periphery of the drum, the filtrate passes through the medium to cells and to a receiver tank.

These filters are used for coal slurries, lime sludges and muds and many other materials.

MINING MISCELLANY

A new company has recently been formed in Portuguese East Africa under the title of "Minerais Basicos de Moçambique Limitada—Lourenco Marques." Its activities will comprise the extraction, purchasing, processing and exportation of minerals produced in the province.

* * *

Work is progressing steadily on the site of the works for the Egyptian Iron and Steel Company at Helwan, 20 miles south of Cairo, which covers about 1,000 acres. The contract for a large power station at El Tabbin, which will supply power for this works, has been awarded to the Hungarian firm of Ganz.

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The condition of the jade mines in the Myitkyina District of Burma has been a subject of comment in the local press. Before the war some thousands of workers were employed in this industry, which annually exported jade to the value of K 60 lakhs (£450,000) as against K 10 lakhs (£75,000) to-day. The number of workers is said to have dropped to 400.

* * *

The first cyclotron to come into operation in the Southern Hemisphere has been opened near Pretoria by the South African Minister of Economic Affairs and Mines, Dr. A. J. R. van Rhijn. Constructed at a total cost of £230,000, including the building, the cyclotron was designed by Dr. S. J. du Toit, Mr. C. A. J. Kritzinger and Mr. J. J. Burgerjon, of the South African National Physical Laboratory, in consultation with Prof. M. S. Livingstone, of the Massachusetts Institute of Technology.

* * *

The National Lead Company of New York will hold 80 per cent of the shares of a new £A500,000 beach mining industry at Port Macquarie in northern New South Wales. The balance of the shares in the new company to be formed for this venture will be held by the Australian company, Mineral Deposits Syndicate. The intention is to build a plant at Port Macquarie at an initial cost of £A3,200,000. The new company will be known as Mineral Deposits Proprietary Limited.

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Preliminary reports on the State's mineral deposits have been submitted to the Attar Pradesh Directorate of Geology and Mining. They are understood to indicate that it would be feasible to set up in the province factories for the production of aluminium, abrasives, sulphuric acid, insulators, glass and plaster. In addition, they have disclosed the existence of rich copper deposits. A pure form of gypsum was found in large quantities along the Nahal River and it was expected that previous estimates of 200,000 tons for gypsum deposits would undergo a big upward revision.

* * *

Appreciable increases in the value of Queensland's mineral production are recorded by the Department of Mines in its report for 1954. The total value of the mineral output was £26,928,870, compared with £21,764,469 in 1953. A pleasing feature was the improved production of gold, which totalled 98,754 fine oz. (71,818 oz.). Copper production rose from 21,409 tons to 27,747 tons and lead from 36,167 tons to 40,714 tons. Zinc was the only major metal to show a decline, production for the year being 19,615 tons against 19,944 tons in 1953.

* * *

Reynolds Jamaica Mines Ltd., are to start soon the expansion of their bauxite plant at Lydfort, Saint Ann. An additional rotary kiln is to be built for the drying of bauxite, a second overhead tramway will be installed for the transportation of ore to Ochorios, a distance of over six miles, and enlarged storage facilities will be installed at the company's port at Ochorios for ore awaiting shipment. The work is expected to take about 10 months.

* * *

Statistics released by the Associated Steamship Lines show substantial increases in exports of metallic ores from the Philippine Islands in 1955. Shipments of copper concentrates rose from 77,415 l.tons in 1954 to 82,396 tons last year, chrome ore to 594,936 tons (427,059), iron ore to 1,450,881 tons (1,053,336), and manganese ore to 10,741 tons (8,001).

* * *

Belgian non-ferrous metal producers are concentrating on the production of high-purity rare metals with a high unit price yield, states the annual report of the Société Générale de Belgique. Most of the large refining concerns have installed important metallurgical laboratories, which are seeking to improve production techniques and reduce costs. Ore supplies have regained pre-war levels, due mainly to the activity of Union Minière. Société de la Veille Montagne has added germanium metal and germanium oxide to its production programme. Compagnie des Métaux d'Overpelt-Lommel has built a new zinc-roasting plant and is using its own special process to produce metallic zinc. The Société Générale Métallurgique de Hoboken has expanded output at its plants in Olen and Hoboken and its activities now include the production of electronically-pure germanium oxide and germanium metal.

* * *

A commission of Spanish mining experts visited Britain recently during a European tour to study measures against miners' silicosis. In future, labour for Spanish mines will depend to a great extent on silicosis prevention and compensation. The team included Sr. Cassaurranz, secretary of the metal trades union; Sr. Sobrino, managing director of La Cruz mines; Sr. Castell, a chief inspector of the Spanish Department of Mines; Sr. Montero, an engineer from the Jaen district; and Dr. Leal, a silicosis specialist. The commission was impressed by the range of British equipment for dust prevention and measurement and by demonstrations of this equipment in action. Informal talks were held with medical and other experts of the Ministry of Fuel and Power and with the N.C.B. Further informal discussions took place at a reception arranged by Holman Bros. Ltd. The commission saw the aluminium prophylaxis installation at Geevor tin mine. A programme of dust-research films was provided by Holman Bros. and the party visited the company's experimental mine. Practical demonstrations were also given at Oakdale Colliery in South Wales during a further stage of the tour conducted by the National Coal Board.

* * *

Copper Cavalcade, a splendidly produced publication issued by the Messina (Transvaal) Development Company, Ltd., traces the company's progress during its first fifty years. It describes a unique venture in copper mining and records the vision and enterprise of Lt.-Col. John Pascoe Grenfell—father of the present chairman—who as founder, chairman and managing director guided the affairs of the company until his death in 1948. About the time of the Great Trek a Bantu tribe from the south settled near the Limpopo to dig for a bright metal, which they hammered and moulded into bracelets, amulets and charms. They called the metal Musina, the spoiler, because when it was fused with iron it weakened the metal. Musina was copper and became corrupted in time to Messina. So originated the name which, through the operations of the famous company, has become synonymous with the Transvaal's modern copper industry. The Messina company has extended its operations beyond the Limpopo. Its Umkondo Mine, in the Fort Victoria district, has been in production since the middle of 1955. Messina are now spending £4,000,000 to make the Molly Mine, 20 miles from Sinoia, the biggest copper mine in Southern Rhodesia.

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A nation-wide public relations programme has been launched by uranium producers of the western United States.

PERSONAL

Dr. Arthur A. Baker has been appointed Associate Director of the U.S. Geological Survey.

* * *

Mr. George Pengelly retires at the end of March from management of the Holman Organization's Home Counties branch, based at the East Acton depot. His successor will be Mr. W. B. Tozer, who will remain London Manager.

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Britain's Fifth Mechanical Handling Exhibition will be held at Earl's Court, London, from May 9 to 19, 1956.

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The International Machine Tool Exhibition, 1956, will take place at Olympia, London, from June 22 to July 6. It will be the largest of its kind ever held in Britain.

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The 87th annual general meeting of the Iron and Steel Institute will be held at the Royal Institution, Albemarle Street, London, W.1, and at the offices of the Institute, 4 Grosvenor Gardens, London, S.W.1, on May 16 and 17, 1956.

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The annual general meeting of the Cornish Institute of Engineers will be held at the lecture theatre of the Camborne School of Mines on Tuesday, March 27, at 7 p.m. Subsequently a paper entitled "Flat Back Cut and Fill Stoping at Zinkgruvan, Sweden," will be read by Mr. D. D. Drury.

CONTRACTS AND TENDERS

South Africa.—TEN/18501. 7,000 lb. of manganese metal, required for the Mint, Pretoria. Issuing Authority, Union Tender and Supplies Board. Closing date, 5/4/56. B.O.T. Ref., ESB/7202/56. Telephone enquiries to Chancery 4411, Extension 738 or 771.

This information is supplied by the Special Register Information Service of the Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

METALS, MINERALS AND ALLOYS

COPPER.—The details of Anaconda's pricing policy for Chilean metal (discussed in a Note and Comment) are still not available; it is stated that the storm in the United States has prevented decisions. Meanwhile the price of copper from the custom smelters is 55 c. per lb. for all metal up to May. Scrap copper was still 45½ c. but dealing was quiet pending a full clarification of the new arrangements. Anaconda Wire and Cable and later Scovill Manufacturing both announced that mill products would now be priced on the basis of 49 c. for virgin metal; almost all fabricators are now in line at this level. Union Miniere du Haut Katanga has raised its price to Fr.53.50 (Belgian) equivalent to 47.62½ f.a.s. New York.

It is reported by *Reuter* that the Soviet Union has offered economic aid to Yugoslavia to make possible the exploitation of Majdanpek. France has already offered—with American backing—to supply mining machinery and equipment; Yugoslavia to repay over five years at five per cent interest in copper mined from Majdanpek. It is being said that Russia is offering comparable assistance over 10 years at two per cent interest, repayment to be made not necessarily in copper. Apart from the financial attractiveness of the Russian offer the Yugoslavs must be tempted by the possibility of repaying in other than copper since one of their objects in mining Majdanpek is to establish a bigger copper processing industry and they are reluctant to export the metal except in fabricated forms. Majdanpek could produce 23,000 tons of blister copper a year.

Alvin A. Meyrowitz speaking at the annual convention of metal dealers in New York has remarked on the place of the dealer in the American copper industry. He called for "understanding" among all sections of the industry and added "I maintain that the buying policies of the custom smelters are inflationary. If the ingot-making industry continuously competed with the custom smelters for the type of scrap that normally flows to their plants then any meeting of prices by ingot makers might easily reflect itself in an increase in buying prices by the custom smelters".

The Chilean President has signed a decree authorizing investments totalling $97,797,000 by U.S. companies in Chile. Of this total, the Anaconda Company is to invest $90,879,000 in machinery, installations and currency. The Kennecott Company will invest $1,900,000, also in machinery, installations and currency. Anaconda is to invest some $36,914,000 in a new plant at Tocopilla, $52,950,000 in extending the Potrerillos plant to exploit the El Salvador deposits and the balance in extending the Chuquicamata plant.

The Chilean under secretary of mines has forecast that Chilean ouput in 1956 will be more than 430,000 tonnes and in 1957, 470,000 tonnes He added that the copper department would be sending delegates to Europe and United States shortly to study the markets there. Chile, he said, would keep its usual markets. This would seem to confirm the view that though more Chilean copper would go to the United States under the new price arrangement, Chile will not want to lose her European customers.

More information is available about the contract between Caja de Creditor Minero and the Nord Deutsche Affinerie of Hamburg. The latter will smelt, refine and sell copper and copper concentrates. The Bank said that 60 per cent of this copper would be sold to the refinery while the balance would remain at the bank's disposal for free sale. The refining agreement with the Hamburg firm will last until December, 1958, while the one on sales will run from May, 1956, until April, 1957.

LEAD.—Lead was moderately active last week in the United States on the basis of 16 c. per lb. New York. Mr. G. M. Baumann of American Smelting and Refining has said that 1956 consumption should be around the 1955 level of 1,193,000 tons. Lead consumption in batteries and solder might be down but increases in tetraethyl and chemical construction should outweigh this fall. Producers' stocks are low he said and supplies tight.

TIN.—Tin has been a quiet market in the United States and prices have tended to drift gently downward. Spot straits metal is now down to 100.62 c. per lb. in New York. From time to time dealers entered the market but for the most part consumers were content to hold their hands and wait for a further decline. The storm damage is also reported to have interfered with the market and made for quiet conditions. *Reuter* described Tuesday's market as "rather tired". Apart from domestic conditions in the United States the facts that the situation in the Middle East has not worsened and that the prospect of a strike of Malayan miners has now very much lessened have helped to induce a quieter tone. However, a "go-slow" policy among port workers at Port Swettenham is in progress and must interfere with shipments at some date; ships are being diverted to Singapore and Penang.

According to the American Can Company the output of cans in the United States last year rose more than eight per cent to 38,500,000. Cans for beer rose 12 per cent and for fruits, vegetables and juices by 11 per cent.

World mine output dropped from 15,000 tons in December to 13,900 in January. This was in spite of a post-war record output for January in Malaya of 5,531 tons; Indonesia and Bolivian output fell respectively to 1,999 and 1,645 tons. World tinplate output rose to 610,000 tons in January mainly to a better output in the United States at 431,840 tons.

Malaya's tin mining industry faces a bleak future, it is stated in a recent memorandum from British and Chinese tin miners who accused the Government of turning a blind eye to their needs. They said that unless something was done quickly to speed up the issue of licences, there was bound to be a serious decline in output, affecting Government revenue. The memorandum stated that the rubber industry was being given every encouragement to meet synthetic competition, but the tin industry was being given no incentive or encouragement. It called for a new deal by establishing mines committees in each of Malaya's nine States to see that there was no delay in issuing licences. The memorandum added that many mines had been forced to close down because of delays in getting leases renewed once they had expired. This was despite the fact that ore was still left unmined in the ground. The memorandum asked that no land in the country known to have deposits should be alienated other than for tin mining until an option had been sought from the Geological Survey to assess its potential value as mining land.

ZINC.—Zinc was a fair market on the basis of 13.50 c. per lb. for prime western grades East St. Louis. Consumer demand has been spotty but in total adequate. American output of recoverable zinc in January was 40,548 tons against 39,615 in December. Production of slab zinc was 86,329 tons in February against 90,313 in January. A total of 2,782 tons went to the stockpile against 1,155 in January. Stocks were 39,833 tons at end-February against 41,330 a month earlier; but unfilled orders were down to 45,255 from 60,717 tons in January.

ALUMINIUM.—In spite of the curtailment of production late in the year due to power shortages, Canadian exports of primary aluminium for 1955 rose to the record total of 515,499 tons, an increase of more than 47,000 tons over 1954. With an installed capacity of 650,000 tons, of which only about 15 per cent is required for domestic consumers, Canada has become the world's largest aluminium trader. It is estimated that at least 75 per cent of all the aluminium moving in international trade originates in Canadian smelters. In spite of substantially increased production and exports, however, Canada was unable to meet all demands for aluminium last year.

The emergence of a second primary producer in Canada's rapidly growing aluminium industry has been brought a stage nearer by the announcement that the Canadian British Aluminium Company Ltd. had awarded contracts to British firms for equipment to be installed at its projected Baie Comeau reduction plant. This company is the recently organized subsidiary of British Aluminium. B.T.H. is to supply £1,750,000 worth of electrical conversion equipment and further equipment to a value of £500,000 is to be provided by the British General Electric Company. The Baie Comeau project has as its eventual goal a 160,000-ton smelter at the Quebec site. The total cost of the installation has been initially estimated at around $130,000,000 and announced plans call for construction in four stages of 40,000 tons capacity each. Work is to be started this spring on the first stage, which is estimated to cost about $40,000,000 and is scheduled for initial operation before the end of 1957. The final stage will be completed in 1965.

In a study prepared for the Royal Commission on Canada's economic prospects, Alcan has predicted that by 1980 the American motor car will contain 200 lb. of aluminium, nearly six times as much as the 1956 models, and aluminium cans will comprise 5-10 per cent of the canning industry's output. The company predicts a "long-term growth" in the world demand for aluminium, this forecast being based on growth in population, rising living standards in the U.S. and other countries, and the growing industrialization of previously "backward" areas. These views are in line with other forecasts by leaders of the aluminium industry. A point noted by

the company is that the price of aluminium to-day is only 15 per cent higher than the average price in 1939, whereas the metal's principal competitors have shown much greater price increases in the same period. The estimated free world capacity in 1960 is 4,462,500 tons, including 1,032,000 tons in Canada and 2,518,000 tons in the U.S. The Canadian capacity of Aluminium Ltd. at the end of 1955 was 650,000 tons. By the end of 1959 this will have been raised to 912,000 tons. The view is expressed that many countries—especially Britain, the U.S., Germany, and others which possess fabricating and manufacturing capacity greater than their primary capacity—" will see the wisdom of relying on Canada for greater supplies of aluminium."

According to Mr. Frank L. Magee, executive vice-president of Alcoa, all evidence indicates that the primary aluminium supply situation in the U.S. is improving to the extent that fabricators can soon start bringing out new products and applications which they have been keeping in the "deep freeze" through lack of the metal. Moreover, requirements for strictly military purposes are declining with respect to total availability.

An indication of the world-wide growth in aluminium usage is afforded by preliminary reports that consumption in India amounted last year to about 20,000 tons as compared with 6,800 tons ten years ago. The growing importance of aluminium to India is leading to accelerated efforts to treble or even quadruple existing primary production capacity in the shortest time possible. The present target is to step up domestic production from 7,500 tons to an immediate 20,000 tons. The intention is to install a further 10,000 tons as soon as possible, with a target date of 1961.

Mr. Manley, the Chief Minister, has stated in the House of Representatives that Jamaica is to seek a greater return from bauxite mining operations on the island than at present. The Government will open negotiations this year with the bauxite companies on the financial returns to the island from this rapidly expanding industry. He stated that bauxite production was rapidly increasing and that by the middle of next year output would be about 4,000,000 tons. Thus Jamaica will soon be among the largest bauxite producers in the world. Last year the bauxite companies exported 2,500,000 tons.

NICKEL.—The probability of an increase in the price of nickel during 1956 is mentioned in the monthly bulletin of the National Association of Purchasing Agents, U.S. According to a report made to the Association's Survey Committee by Mr. Harold Berry of the Ingersoll-Kalamazoo division, Borgwarner Corporation, there is pressure on the major producer to raise its published price. To meet the 1956 estimated requirements of the U.S. would call for the diversion of at least 18,000 s.tons from delivery to stockpile to delivery to industry during the year, states the report. Any increased consumption would call for increased diversion. INCO's desire to hold prices stable, in the long-term interests of the nickel industry is, of course, well known.

Nicaro, the U.S. States-owned nickel plant in Cuba, has returned the Government 24 per cent of its investment in the property in the past four years. The Government's total investment in the plant is approximately $47,400,000. Production has been increased from 8,900 s.tons in 1952 to 15,150 tons in 1955. The average recovery of nickel has materially improved Over-all expansion of the plant's capacity by 75 per cent has passed the half-way mark. Present work schedules call for completion of construction this Autumn. Mr. E. F. Mansure, the retiring administrator of General Services, emphasised recently that G.S.A. is firmly committed to make every possible effort to dispose of this plant to private industry, on a sale or lease basis, as soon as there is a possibility of obtaining a fair value for it.

The London Metal Market

(From Our Metal Exchange Correspondent)

The main talking point during the week has been the Anaconda decision to use the L.M.E. quotations as a basis for the sale of its Chilean copper production, and opinion has not yet crystallized as to the likely repercussions. One school of thought is that as the agreement to ship approximately two-thirds of the output to Europe is now abrogated, a larger percentage will be absorbed in the future by the States with consequent shortage in Europe and rising prices in London. It should be remembered, however, that the needs for the first-half of this year are largely covered by existing contracts and the tonnage of copper to be bought during the second-half of the year is at present an unknown quantity, but given freedom from strikes there is every posibility that there will be additional Rhodesian production available for this market. The other school of thought is that the diversion of copper to the States will result in the premium market gradually disappearing with the consequent reduction in London prices.

Whatever the result, this new recognition of the L.M.E. as a pricing basis is another step towards its re-establishment as the only real centre for metal prices, and it is hoped that all those interests using the market as a pricing basis will once more reconsider the desirability of playing a more active part in its operations.

The markets themselves have been uninteresting, except for the fall in tin due to better news from the Far East and the contraction in the backwardations of both tin and copper, the former being due to the anticipated arrivals of additional metal and the latter due to the continuance of re-deliveries by consumers of wirebars.

On Thursday morning the Eastern price for tin was equivalent to £785¾ per ton c.i.f. Europe.

Lead and zinc have been featureless, although the undertone of the former has been steady whilst that of the latter has been uncertain.

Closing prices and turnovers are given in the following table:

	March 15		March 22	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£428	£429	£417	£418
Three months	£417½	£418	£411	£411½
Settlement	£429		£418	
Week's turnover	5,025 tons		3,875 tons	
Tin				
Cash	£822½	£825	£763	£764
Three months	£792½	£795	£757½	£759
Settlement	£825		£764	
Week's turnover	450 tons		760 tons	
Lead				
Current half month	£120	£120½	£120½	£120¾
Three months	£118¼	£118½	£118¾	£118½
Week's turnover	3,200 tons		2,975 tons	
Zinc				
Current half month	£103	£103½	£100½	£100¾
Three months	£99½	£99¾	£98¼	£98½
Week's turnover	3,200 tons		3,675 tons	

OTHER LONDON PRICES — MARCH 22

METALS

Aluminium, 99.5%, £179 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60% basis) 23s. 6d./24s. 6d. nom. per unit, c.i.f.
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 12s. 0d. lb.
Chromium, 6s. 11d. lb.
Cobalt, 21s. lb.
Gold, 249s. 4½d.
Iridium, £29/31 oz.
Manganese Metal (96%-98%) £269 according to quantity
Magnesium, 2s. 4d. lb.
Nickel, 99.5% (home trade) £519 per ton
Osmium, £24/27 oz. nom.
Osmiridium, nom.
Palladium, £8 0s./£8 10s. o...
Platinum U.K. and Empi... Refined £34 0s. oz. Imported £39 0s./£41 0s. oz.
Rhodium, £40/£42
Ruthenium, £16/£18 oz.
Quicksilver, £86 10s. ex-warehouse
Selenium, 112s. nom. per lb.
Silver, 79 ... t.oz. spot and f'd.
Tellurium, 15s. 6d. 16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 65% 8s. 6d. c.i.f. 60% 8s. 3d. lb.
Chrome Ore—
Rhodesian Metallurgical (semi-friable) 48% £15 2s. 6d. per ton c.i.f.
,, Refractory 45% .. £14 2s. 6d. per ton c.i.f.
,, Smalls 42% .. £12 2s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite, Raw (ground) .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. 8s. 2½d. nom. per lb. c.i.f.
Wolfram and Scheelite (65%) .. 261s. 0d./266s. 0d. c.i.f.
Tungsten Metal Powder (98% Min. W.) .. 21s. 2d. nom. per lb. (home)
Ferro-tungsten (80%-85%) .. 18s. 2d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £39 3s. 9d. d/d per ton
Ferro-manganese, home .. £59 10s. 0d. per ton
Manganese Ore Indian Europe (46%-48%) basis 125s. freight. .. .. 100d./102d. per unit c.i.f.
Manganese Ore (43%-45%) .. 95d./97d. per unit c.i.f.
Manganese Ore (38%-40%) .. 88d./90d. per unit
Brass Wire .. .. .. 3s. 10½d. per lb. basis
Brass Tubes, solid drawn .. 2s. 2½d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The past week has been one of retrenchment. Markets, which started off fairly firm, mainly held their levels after some profit-taking. There was a small increase in business. The government determination to hold their present deflationary policy proved encouraging although share prices must necessarily remain uncertain until after the budget. Some circles in the city now believe that measures taken in the budget may not be so severe as had originally been anticipated due to progress in the nation's financial position.

The Edinburgh Corporation five per cent Stock which was floated during the week opened at a small premium after being heavily over-subscribed.

In the Kaffir market the tax reductions in favour of mining companies announced in the South African budget had a favourable effect. It had recently been thought that no significant change would be made. Although the present measures only involve fairly small sums, it is considered a step in the right direction. In the finance house group, African European rose following favourable mention in the press and buying caused an advance in Anglo American Corporation in anticipation of the dividend. There was also renewed interest in General Mining, buying of an investment nature occurred in these shares which have a steady dividend record and yield 6¾ per cent at the present price.

Individual Rand mines showed little response to the tax concessions. Some of the older properties hardened and tax concessions for ultra deep mines raised hopes that some of the older properties may also benefit in this direction. Vaal Reefs hardened on the start of official production but Vogelstruisbult continued to fall away on selling from Johannesburg. These shares now stand at a low level and the statement issued by the company had little effect on the share price. This statement was criticized in market circles as giving little information upon which to base a judgment of the mine's prospects.

In the Orange Free State, Free State Geduld were a popular feature supported by rumours of good development results in the area of No. 1 shaft. President Brand also jumped on hopes that a good quarterly report would be forthcoming next month. There was renewed interest also in OFSITS, sustained by the rise in Free State Geduld, President Brand and Western Holdings.

Diamond shares were a better market having shaken off last week's rumours of a large Russian find. Negotiations between the Williamson interests and the Diamond Corporation are reported to be proceeding satisfactorily.

The news that Anaconda proposed to sell their output at London metal prices caused a jump in copper. Demand in the United States for this metal remains at a high level and Russian buying has also been reported. The high price brought in Wall Street buying for Rhodesian copper shares, and Chartered, which stands to benefit from the royalties was particularly favoured. News of a labour dispute at Bancroft did little more than check the rise and Rhodesia Katanga jumped in front of the coming report. Messina in conjunction with Lancashire Steel, are negotiating to purchase the Rhodesian Que Que Steelworks, the former company has acquired large iron ore deposits in the neighbourhood. Mount Lyell were a good market at 28s. 6d. on favourable press comment.

Barriers were a good market and there was renewed interest in Lake George mines where a substantial increase in distribution is looked for this year. Frontino rose, there were rumours in the market of a fresh bid to gain control of the company.

The miscellaneous base metal group was firm, Consolidated Murchison and Wankie Colliery being outstanding—the latter company are investigating the possibilities of an oil from coal plant at Lubimbi in conjunction with Rhodesian Anglo American.

The sharp increases in base metal prices and the strength of Wall Street brought about sharp gains in Canadian Mines.

Finance	Price Mar. 21	+ or — on week
African & European	2⅝	+ ⅛
Anglo American Corpn.	8⅛	+ ¼
Anglo-French	19/9	—3d
Anglo Transvaal Consol	28/1½	.....
Central Mining (£1 shrs)	40/-	+6d
Consolidated Goldfields	57/6	—6d
Consol. Mines Selection	33/9	+7½d
East Rand Consols	1/9	+3d
General Mining	4⅛	+ ⅛
H E. Prop.	8/-	.....
Johnnies	38/9	.....
Rand Mines	3⅜	+ ¼
Rand Selection	40/7½	+7½d
Union Corporation	39/-	+1/-
Vereeniging Estates	4½	.....
Writs	35/-	—7½d
West Wits	39/3	—6d
Rand Gold		
Blyvoors	25/-	+3d
Brakpan	7/-	+3d
Buffelsfontein	27/3	+3d
City Deep	9/6	.....
Consol. Main Reef	19/4½	.....
Crown	2½	+ ⅛
Daggas	2⅞	+ ⅛
Dominion Reefs	21/-	+6d
Doornfontein	22/6	.....
Durban Deep	30/7½	.....
E. Champs	4/-	.....
E. Daggas	9/6	.....
E. Geduld (4s. units)	34/3	+3d
E. Rand Props.	2⅜	+ ⅛
Geduld	4¼	.....
Govt. Areas	5/3	+3d
Grootvlei	21/3	+9d
Hartebeestfontein	37/3	—6d
Libanon	7/6	+3d
Luipaards Vlei	16/3	.....
Marievale	21/-	+3d
New Kleinfontein	5/3	—3d
New Pioneer	14/9	.....
Randfontein	49/3	+1/3
Robinson Deep	14/9	.....
Rose Deep	10/3	.....
Simmer & Jack	4/-	.....
S.A. Lands	21/3	+1/3
Springs	2/10½	.....
Stilfontein	25/6	—3d
Sub Nigel	33/1½	+7½d
Vaal Reefs	32/-	+1/-
Van Dyk	3/3	.....
Venterspost	13/6	.....
Vlakfontein	17/6	+6d
Vogelstruisbult	19/6	—2/-
West Driefontein	5½	+ ½
Rand Gold contd.		
W. Rand Consolidated	39/4½	+1/3
Western Reefs	32/6	.....
O.F.S. Gold		
Freddies	7/9	.....
Freddies Consolidated	4/6	.....
F.S. Geduld	4⅞	+ ⅛
Geoffries	12/9	.....
Harmony	26/4½	+7½d
Loraine	5/10½	—1½d
Lydenburg Estates	17/6	.....
Merriespruit	11/-	+1½d
Middle Wits	12/7½	—1½d
Ofsits	59/3	+1/6
President Brand	63/1½	+1/10½
President Steyn	33/6	+3d
St. Helena	27/-XD	—3d
Virginia Ord.	11/-	+1½d
Welkom	22/6	+9d
Western Holdings	3⅛	+ ⅛
West African Gold		
Amalgamated Banket	1/9	.....
Ariston	5/-	.....
Ashanti	19/3	—6d
Bibiani	3/4½	.....
Bremang	1/4½	.....
G.C. Main Reef	2/1½	—1½d
Konongo	1/10½	.....
Marlu	11d	.....
Taquah	1/4½	—1½d
Western Selection	8/-	—1½d
Australian Gold		
Gold Mines of Kalgoorlie	12/7½	.....
Great Boulder Prop.	11/-	.....
Lake View & Star	16/-	—3d
Mount Morgan	23/-	—3d
North Kalgurli	6/9	+6d
Sons of Gwalia	2/10½	.....
Western Mining	9/6	.....
Miscellaneous Gold		
Cam & Motor	8/9	+1½d
Champion Reef	4/4½	+1½d
Falcon Mines	7/4½	—1½d
Globe & Phoenix	25/9	—9d
Motapa	1/1½	.....
Mysore	2/4½	+4½d
Nundydroog	6/3	—1½d
St. John d'El Rey	20/-	+1/6
Zams	58/1½	+3/1½
Diamonds and Platinum		
Anglo American Inv.	9	+ ⅛
Casts	24/9	—1½d
Cons. Diam. of S.W.A.	8	.....
De Beers Defd. Bearer	6⅝	+ ⅛
De Beers Pfd. Bearer	15	+ ¼
Pots Platinum	12/-XR XD	+9d
Watervaal	19/- XR XD	+6d
Copper		
Bancroft	39/3	+9d
Chartered	75/-	+4/-
Esperanza	3/9	+1½d
Messina	10⅛	+ ⅛
Nchanga	16¼	+ ⅛
Rhod-Anglo-American	6⅜	+ ¼
Rhod-Katanga	30/7½	+1/4½
Rhodesian Selection	58/-	+6/-
Rhokana	45½	+2½
Rio Tinto	34XR	.....
Roan Antelope	30/3	+1/1½
Selection Trust	4⅜	+ ¼
Tanks	8½	+ ¼
Tharsis Sulphur Br.	4¼	.....
Tin (Eastern)		
Ayer Hitam	21/6	+6d
Gopeng	9/3XD	—4½d
Hongkong	7/1½	.....
Ipoh	23/-	.....
Kamunting	9/3	.....
Kepong Dredging	2/7½	.....
Kinta Tin Mines	17/9	.....
Malayan Dredging	9/10½XD	+3d
Pahang	12/7½	+1/-
Pengkalen	11/-	+3d
Petaling	8/6	+1½d
Rambutan	25/-	.....
Siamese Tin	9/1½	.....
Southern Kinta	15/7½XD	—3d
S. Malayan	8/3XD	+1½d
S. Tronoh	7/1½	.....
Sungei Kinta	15/6	.....
Tekka Taiping	8/7½	.....
Tronoh	9/1½	+1½d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	11/1½	—1½d
Beralt Tin	39/-	+6d
Bisichi	5/10½	—1½d
British Tin Inv.	22/9	+2/3
Ex-Lands Nigeria	2/7½	.....
Geevor Tin	15/10½	.....
Tin (Nigerian and Miscellaneous) contd.		
Gold & Base Metal	1/6	—1½d
Jantar Nigeria	5/7½	.....
Jos Tin Area	12/3	.....
Kaduna Prospectors	1/9	.....
Kaduna Syndicate	2/9	.....
London Tin	9/4½	+6d
United Tin	1/7½	+1½d
Silver, Lead, Zinc		
Broken Hill South	58/6	+6d
Burma Corporation	3/7½	+4½d
Consol. Zinc	51/6	+3/-
Lake George	15/-	+1/-
Mount Isa	18/6	+7½d
New Broken Hill	44/3	+1/9
North Broken Hill	95/-	+2/-
Rhodesian Broken Hill	12/4½	—6d
San Francisco Mines	25/-	+10½d
Uruwira	5/7½	.....
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	48/9	+9d
Associated Manganese	38/-	+6d
Cape Asbestos	9/3	+6d
C.P. Manganese	31/-	+3d
Consol. Murchison	65/7½	+4/4½
Natal Navigation	3⅜	+ ⅛
Turner & Newall	99/-	+6d
Wankie	16/9	+7½d
Witbank Colliery	5	—¼
Canadian Mines		
Dome	$27	—1
Hollinger	$52	+5
Hudson Bay Mining	$128	+4
International Nickel	$164½	+2
Mining Corpn. of Canada	£9½	+ ¼
Noranda	$116	+9
Quemont	£10¼	.....
Yukon	4/4½	.....
Oil		
Apex	30/6	+6d
Attock	41/3	+9d
British Petroleum	5⅛	+ ⅛
Burmah	3½	+ ⅛
Canadian Eagle	55/6	+2/-
Mexican Eagle	21/7½	—4½d
Shell	7⅛	+ ⅛
Trinidad Leasehold	35/9	+3/3
T.P.D.	35/6	+3/-
Ultramar	36/6	+9d

COMPANY NEWS AND VIEWS

Chartered's New Royalty Basis

An interesting point which emerged from Mr. Hely Hutchinson's statement yesterday to shareholders at the annual meeting of The British South Africa Company (a report of which will appear in our next issue) was that an amicable arrangement has been come to between Chartered and the Copperbelt producers regarding a revised basis for assessing royalty payments.

Under the original deeds of grant, Chartered has the right, should the need arise, to substitute some other representative price standard for that provided by the pre-war London Metal Exchange contract. Since the re-opening of the Metal Exchange the pre-war blister contract has, of course, no longer been available, so that it has in any event become necessary to substitute an alternative pricing basis. It appears from the President's statement yesterday that a satisfactory alternative has now been worked out, which we understand to be on the basis of a percentage allowance off the London Metal Exchange quotation for electro. This appears to be an eminently sensible arrangement which preserves, as closely as is possible under post-war conditions, the intention of the original basis of valuation.

In his statement the President makes it clear that agreement has been reached not without difficulty, as the R.S.T. Group had reservations about accepting an L.M.E. quotation as a representative basis for pricing copper under present-day conditions. This, of course, is in line with Mr. Prain's often expressed view that owing to the post-war thinness of the L.M.E. market, a weighted average of the various prices at which copper is dealt in now provides a truer index of world prices. As readers will be aware, this is not a thesis to which *The Mining Journal* subscribes, and in our view it would have been unfortunate if some other pricing basis had been agreed on at a time when the whole trend of market events is towards a more broadly based adherence to the L.M.E. price, as evidenced by the decision last autumn of the American custom smelters and last week of Anaconda's Chilean subsidiaries to follow the London price.

Nevertheless Mr. Prain's standpoint on this matter has been thoroughly consistent throughout and it is, therefore, not surprising to learn that he has reserved the right to challenge the correctness of the new basis which Chartered has selected, although without any consequential rights to retrospective readjustment of prices. In point of fact it may well be that in the long run the R.S.T. Group will not suffer financially through paying royalties on an L.M.E. basis as there is good reason to suppose that when the break in copper prices comes, the downward movement will be headed by the L.M.E. quotation. Thus there may well be a period—conceivably even a long one—during which the R.S.T. fixed price will remain substantially above the L.M.E. price.

Referring to the company's important future commitments—which include contributions towards Bancroft Mines and Kariba Gorge hydroelectric scheme, Mr. Hely Hutchinson stated that future outlays in this respect would amount to some £8,000,000 in excess of present net cash resources. Yet these outlays were not all required at once and there was, therefore, no reason to doubt that they could be met as they matured. Chartered should thus be able to maintain its present annual dividend rate.

With regard to future revenue, Mr. Hely Hutchinson provided an interesting estimate of how the company would fare with the price of electrolytic copper at about £240 per ton. Under these circumstances, on the basis of an annual copper production rate for Northern Rhodesia of only 400,000 tons, Chartered's net annual income from all sources, after tax calculated at current rates, would not be likely, he said, to be far short of £4,000,000. During the past year ended September 30, 1955, Chartered's group profit and loss account showed a net profit of £5,617,654. Dividends amounting to 30 per cent on the doubled issued ordinary capital of £13,140,753 absorbed £2,266,780. These profits reflected mainly royalty income on 340,000 tons of copper produced in Northern Rhodesia, valued for royalty purposes at an average of £289 per ton.

R.S.T. Loans Aid Central African Development

Examples continue to rise of how the copper industry in Northern Rhodesia is fulfilling its self-appointed role of financing the development of Central African Federation. The most recent example was made known last week when the Rhodesian Selection Trust Group of copper companies announced that it had advanced £2,000,000 to the government of Northern Rhodesia and £1,000,000 to the government of Nyasaland to be spent at the discretion of the two governments on the capital costs of African development. Half the advances will be made by Roan Antelope and the other half by Mufulira.

The loans to both governments will be interest free until June 30, 1960, at which date the two governments will have the option of repaying the loans in full or in part, or of converting the loans in full or in part to Northern Rhodesian or Nyasaland government bonds bearing interest 4½ per cent per year with the period of redemption not being more than 20 years.

In letters to the governor of both territories, Mr. R. L. Prain, chairman of R.S.T., explained that the reason why the loans had been made was that his group recognized that the presence of the Copperbelt in Northern Rhodesia, the payment by mining companies of relatively high wages to African employees and the introduction for those employees of relatively advanced living conditions created special problems for the Northern Rhodesian government in relation to the education and development of Africans throughout the territory. If the development plan was agreed to by the Legislative Council, the Northern Rhodesian government would provide from its own resources over the next four years a sum for African development in the territory amounting to more than double the Rhodesian Selection Trust loan.

Messina and Rhodesian Steel

Confirmation has been received that negotiations between Messina (Transvaal) Development, Lancashire Steel Corporation and the Rhodesian Federation Government for the expansion of iron and steel output have reached an advanced stage. Plans envisage the delevopment of Messina's Bukwe iron deposit. A new Rhodesian company to take over the steel plant at Que Que is accordingly expected to be formed with Lancashire Steel and Messina as the principal shareholders. Under the proposed arrangements output will be stepped up from 40,000 tons of pig iron a year to 200,000 tons. Estimated capital required for this purpose is believed to be about £6,000,000. Part of this may be raised in London. It is understood that Messrs. Philip Hill Higginson and Co. are associated with the scheme.

Union Corporation Pays Final of 70 per cent

A final dividend of 1s. 9d. per 2s. 6d. share (70 per cent) has been recommended by Union Corporation on its issued ordinary capital of £1,162,500. Total distribution for the year ended December 31, 1955, has thus been brought up to 110 per cent less tax. In 1954 an interim of 20 per cent tax free preceded a final of 73½ per cent less tax.

After providing £483,400 (£502,800) for U.K. tax, profits of £1,119,689 compares with £1,081,279.

Statement from Vogels

Prompted by recent adverse rumours as to the development position at Voelstruisbult Gold Mining Areas—which has brought the company's 10s. shares down from some 30s. at the beginning of 1955 to 20s., the company has issued the following statement.

"Arising out of numerous inquiries received from shareholders during the last few days the Board wishes to state that operations at the mine continue normally and that progress of operations has been reported fully to shareholders in the usual manner."

Western Selection's Canadian Exploration

Total assets of Western Selection and Development Company at September 30, 1955, expanded to £1,837,300 from £1,521,880. Quoted investments had a market valuation of £1,056,869 as compared with £1,080,275 at the end of the previous year. Current assets at £561,069 exceeded current liabilities by £495,434.

Mainly due to the liquidation of Marlu Gold Mining Areas together with the fact that no dividend was paid by Gold Coast Main Reef during Western Selection's year, income from investments dropped to £96,035 from £123,385. On the other

hand, profits from sharedealing moved up to £21,796 from £18,776.

Year to Sept.30	Total Revenue	Taxation	Net Profit	Dividend	To Reserve	Carry Forward
	£	£	£	£	£	£
1955	128,388	8,205	102,066	53,906	nil	117,437
1954	154,156	1,215	128,903	82,500	38,151	69,277

Distribution on the company's increased issued ordinary capital of £937,500 was 10 per cent. This compared with a total of 17½ per cent on the previous issued capital of £750,000. In considering the past year's dividend, the fact that additional funds provided by the capital increase had been employed in the business for only six months was taken into account. Financial commitments both in West Africa and Canada together with adverse effects of the recent strike of African employees on the Gold Coast were given consideration.

The bulk of Western Selection's investments are in West African gold and base metal mining companies. Also included in the portfolio are some of the most promising South African Orange Free State mines.

During the past year Western Selection registered a new company in Canada under the title of Anglo Barrington Mines. The objectives of this Company are to prospect, develop and exploit nickel, copper and uranium claims acquired in the provinces of Saskatchewan and Manitoba. Air and ground surveys are being carried out. But while drilling programmes have been drawn up the large areas and severe climatic conditions involved will make prospecting difficult. Although results have so far been satisfactory, it is as yet too early to comment on prospects.

At their present price of around 8s. Western Selection 5s. shares yield about 6¼ per cent. Major General W. W. Richards is chairman. Meeting, London, April 12.

OF INTEREST to small prospective Mine Owners. Barytes, Lead, Zinc mine, shallow, drained, Barytes partly developed, for disposal. Substantial reserve. High quality material. Going concern, fully equipped. Easy access from Carmarthen, South Wales. Further particulars from: Easton, Strand, Swansea. Phone 2717.

METALLURGIST. A large Mining Company operating in Upper Burma, climate sub-tropical and healthy has vacancy with promotion prospects for a METALLURGIST. Salary commensurate qualifications and experience full details of which must be submitted with application. Write Box N.100 Willings, 362 Grays Inn Road, London, W.C.1.

THE BECKERMET MINING COMPANY LTD.
CUMBERLAND

An Assistant Mining Agent is required by the above Company. The successful applicant should possess A.R.S.M. or equivalent qualification or First Class Certificate C.M.A. 1911. The duties include metalliferous mining, limestone, quarrying and fireclay working underground. Age group 35/45. The salary offered is in the region of £1,600 per annum, or upwards according to experience, with excellent prospects for early promotion. Membership of a Staff Pension and Life Assurance scheme is obligatory and an Assisted House Purchase scheme is in operation.

Applications, with details of experience and testimonials, to:—

Managing Director,
Beckermet Mining Co. Ltd.,
Moss Bay,
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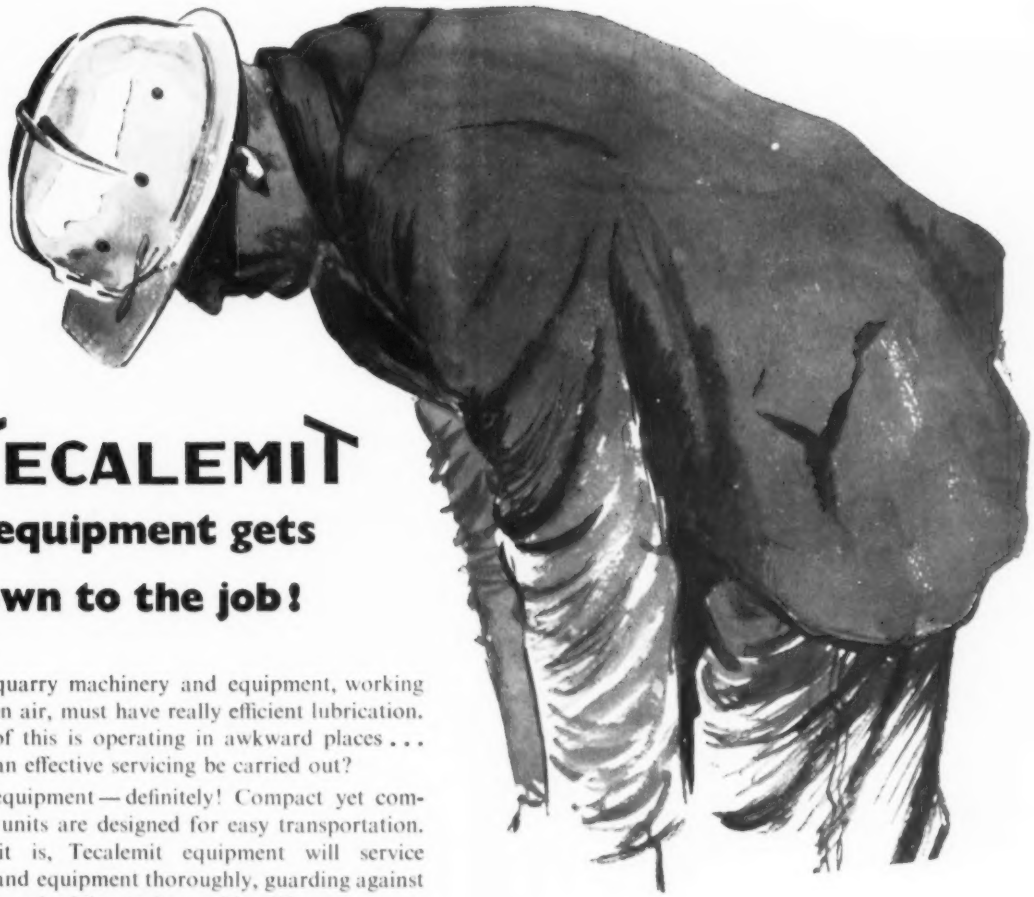

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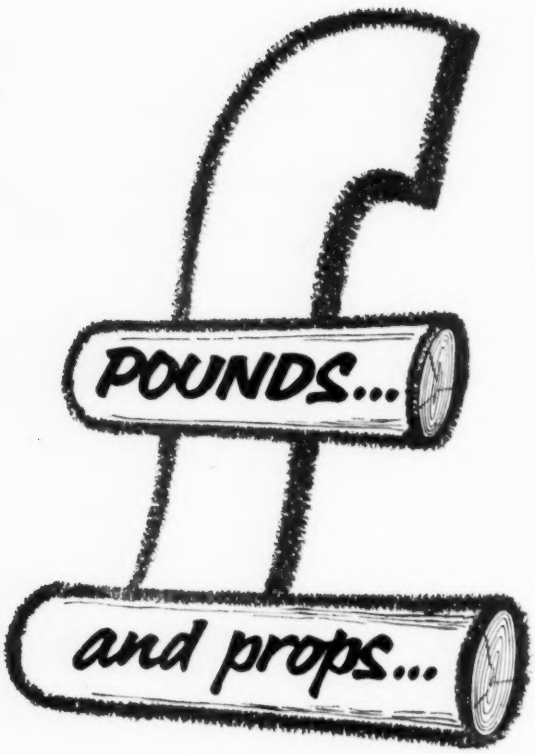

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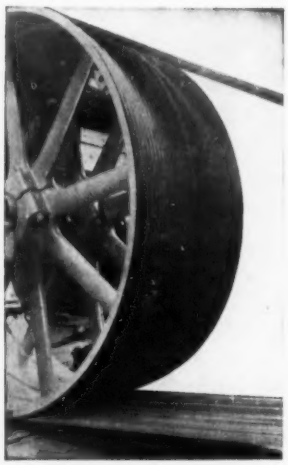

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